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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

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Guaranteed Circulation This Issue

9865, of Which 9372 Is Paid

WHAT IS AN INDEPENDENT TELEPHONE COMPANY?

TO THE nearly 9 million subscribers to Independent Service, it is one thing . . . It is the single lighted window that shines through the quiet night of a river town. It's the voice of a neighbor across the lonesome miles of sunbaked prairie. It's the comfortingly quick reply to a call of distress. It's Joe Cooke with his spikes breaking the ice sheath on the pole at the crossroads. It's Don Davison, the manager, standing up in the pew ahead on Sunday and singing. It's a neighborly thing, a warm and friendly part of life. It's people, not stock certificates.

To the owners, managers and employees of the telephone companies themselves, it's a way of life.

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FLASHES AND PLUGS

SEEING LIE. A woman in Minnesota telephoned the police station to report a "blind man" walking in circles in the park. She said:

"He can't find his way; he's been there over an hour, feeling around with his white cane. Come and help him."

A policeman went to the park and found that the "blind man" was a park employe picking up paper and other trash with a pointed white stick.

• • •

AMERICANA. Richard Armour, a Harvard Ph.D. and professor of English at Scripps College in California, has written "an improbable account of American history," entitled *It All Started with Columbus.*

Among other things, Mr. Armour says:

The telephone was invented by Alexander Graham Bell, after whom the telephone bell is named.

Outgrowths of the telephone include the telephone booth, in which one has the choice of light or air, and the telephone book, a large volume that permits almost everyone to see his name in print.

• • •

NO TRICKS, NO TREAT. In Saginaw, Mich., a switchboard operator answered as usual: "City Hall."

"What?" the caller responded.

"City Hall," the operator repeated, but she heard no come-back.

"This is City Hall," she tried again. "With whom do you wish to speak?"

"No one, I guess," said the feminine voice at the other end. "I just discovered this number while going through my husband's pockets."

• • •

PUBLIC RELATIONS. The versatile Vienna (Austria) Telephone Co. which has already installed a "fairy-tale service" for its youngest subscribers, announced a new service: Puzzles for adults.

By dialing a certain number, subscribers may listen to a new puzzle every second day.

Those who think they have found the solution can mail it in once a month, and maybe get a prize.

• • •

CHOICE SEAT. A young man in Dallas, Tex., reports that his 14-year-old brother recently came into town for the Rural Youth Day fair.

As soon as he arrived the lad telephoned his brother and asked him to meet him.

"Where are you?" the older boy asked.

And the youngster replied: "I'm on the front porch of the Cotton Bowl."

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★ ★ ★ IN THE ★ ★ ★ NATION'S CAPITAL

by FRANCIS X. WELCH WASHINGTON EDITOR

New England T&T rate case gives Massachusetts Supreme Court choice of affirming or rejecting strict investment rate base. . . . "End-of-period" rate base permitted in Arkansas and Colorado decisions. Predicts rough sailing ahead for GOP. Nation's Capital served by area dialing.

"MASSACHUSETTS, there she stands," is a fine old motto and a tribute to the great Bay State. In matters of public utility regulation, Massachusetts has enjoyed a reputation for stability which can hardly be equalled anywhere else in the Union.

For it was in Massachusetts that the concept of "prudent investment," as a measure of the rate base to be used in public utility rate fixing, was first established. To this doctrine, successive regulatory commissions of Massachusetts have stubbornly adhered for a number of decades.

In fact, all during the period when Smyth *v.* Ames was the "law of the land" and when many other state commissions had the "present fair value" requirement for the utility rate base thrust upon them by federal courts of that era, the Massachusetts Department of Public Utilities somehow managed to follow its chosen course of fixing utility rates on "prudent investment." The federal courts never got around to issuing an injunction against this Massachusetts doctrine, as the courts did in other state commission cases.

It was in 1923 that a native son and former justice of the Massachusetts Supreme Judicial Court, tried to get the United States Supreme Court to adopt the Massachusetts theory of a "prudent investment" rate base. This was the late and distinguished Justice Brandeis, who wrote his celebrated special concurring opinion outlining the advantages of the "prudent investment" concept, in the Southwestern Bell Telephone Co. Case (262 US 276, PUR1923C 193). But a majority of his colleagues would have none of it, at that time.

Later on, beginning in 1933, the U.S. Supreme Court began a trend towards a toleration of strict original cost—which is a variation of prudent investment. This trend, as readers of this department are well aware, culminated in the Hope Natural Gas Co. Case in 1944 (51 PUR NS 193). In that case, the U.S. Supreme Court washed its hands of any requirement for rate base formula used by state commissions.

Meanwhile the Massachusetts department continued the even tenor of its ways. In 1949, however, in the Lowell Gas Co. Case (78 PUR NS 506) its own state supreme court decided that the strict manner in which the Massachusetts commission was using a prudent investment rate base was not realistic in the light of present-day inflationary conditions. The court then held that the gas rates fixed by the commission in that case were confiscatory and unlawful. The commission's order was set aside. The court's opinion in that case stated:

"The department has professed to adhere to its rule (of prudent investment rate base) notwithstanding the statements of the Supreme Court of the United States and of this court that the rates must be sufficient to yield a fair return on the value of the property employed after paying costs and carrying charges. See Opinion of the Justices (1925) 251 Mass 569, 610, 147 NE 681; Horton *v.* Attorney General (1929) 269 Mass 503, 509, 169 NE 552. It is unnecessary to expatiate upon this aspect of the case, as in any event the order . . . is confiscatory."

It will be seen from the foregoing passage, however, that the Massachusetts court, although taking a critical view of the state commission's rule, did not spell out what kind of a rate base *should* be used in utility rate fixing. All of which leads to an interesting situation which now confronts the same court. It is a telephone rate case involving the New England Telephone & Telegraph Co.

In this decision, handed down last September, the Massachusetts Department of Public Utilities persisted in following its investment rate base (TELEPHONY, Nov. 7, p. 36). It used the average net plant investment for the year 1952, *but excluded plant under construction, plant held for future use, and cash working capital!*

On this rate base, it allowed a rate increase of $4,519,000 out of a requested increase of $10,200,000. This rate increase was estimated to yield a return of 6.31 per cent, which would seem to be based mainly on a finding that such a return would yield 8.5 per cent on equity capital and be enough to attract additional equity funds.

On the Massachusetts commission's own figures, this return of 6.31 per cent is not oppressive, as rate cases go these days. The commission's opinion fund that it was well above the "bare bones" cost of capital. But the stringency of the rate base gives no recognition to the factor of inflation. In other words, a more liberal rate base would pull the rate of return down quite a bit from the alleged 6.31 per cent. The commission admitted that inflation existed. But it contended in its opinion that the rate of return allowed reflects the present economic situation, even though "it be ever so harsh in its results to some investors."

So now the New England Telephone & Telegraph Case has been appealed to the Massachusetts Supreme Judicial Court. That is why students are watching to see what the court is going to do, in the light of its 1949 lecture to the commission in the Lowell Gas Case. The New England T&T Case, therefore, provides the Massachusetts court with a new opportunity to affirm or reject the Massachusetts commission's traditional stubborn adherence to a strict investment rate base.

We have already had, thus far in this year of 1953, several state commissions being switched away from a strict cost rate base practice (and into a required recognition of present-day inflationary trends) by their own state supreme courts. The decisions in telephone cases earlier this year in Maine and Illinois are most noteworthy along this line. If the Massachusetts commision should be blasted out of its own special rate-making bastion, which it has occupied for nearly half a century, we will really be witnessing something in the nature of a regulatory revolution in this country.

Two other recent telephone rate orders by state commissions reflect a slightly more liberal attitude on the rate base. Both of these, decided early last month, permitted the use of "end-of-period" investment rate bases. In one of these cases the Arkansas Public Service Commission authorized Southwestern Bell Telephone Co. to increase rates by $2,550,000 (out of a requested increase of $3,850,000) with a resulting estimated return of 6 per cent, using a rate base as of the end of 1952. The commission also allowed the year-end level of expenses and taxes as more appropriate than average period figures.

A similar conclusion was reached by the Colorado Public Utilities Commission in allowing the Mountain States Telephone & Telegraph Co. a $4,011,000 rate increase out of a request of $6,201,000—the estimated return being 6.69 per cent. The commission explained that the end-of-period rate base was "more realistic for a public utility engaged in an abnormal expansion program and confronted with constantly increasing investment and operating costs than one based on average investment or projected or speculated investment which bears no relationship to actual conditions at the year end." The Colorado commission used the end of period figures as of Apr. 30, 1953, including plant under construction and plant held for future use. (Note that the Massachusetts commission specifically excluded these two items in the New England Telephone & Telegraph Case.)

Breakers Ahead for the GOP

The Republicans found out the worst when the voters went to the polls two weeks ago in a few, but significant, off-year elections. Professional GOP politicians attempted to brush them off as the result of "local influence" or "cross currents," and insisted that the Eisenhower administration was not at issue. But despite all alibis, Chairman Hall of the Republican National Committee hit the nail right on the finger when he said bluntly "as of today, we are in trouble." Administration people in Washington who have scarcely settled down in their new jobs are wondering what happened to take the bloom off the Eisenhower honeymoon with the voters, so early and so definitely.

It is a serious question for the business community, including public utilities. They have an important stake in political trends, especially these days when all kinds of politics are mixed up with ideological devils and threats to our enterprise system.

Your - correspondent has shopped around among people who ought to know, or who profess to know the answers. Here is the resulting analysis. There are several basic factors for the voters' discontent.

First, we must remember that the Democratic party is larger than the Republican party, on the basis of registration. This is another way of saying that the United States is *normally* Democratic—a political shift brought about by the Franklin D. Roosevelt regime, before which it could have been safely stated that the country was *normally* Republican.

In 1952, President Eisenhower was able to swing away many voters from their Democratic affiliation because of his personal popularity. Even that attraction did not extend to all the candidates of his party. It was only a year ago that we saw Ike voted into the White House with an overwhelming majority in the electoral college, while his running mates in Congress barely skimped into control of the House and Senate. Obviously, therefore, the President was more popular than his party. So, it naturally follows, when the President was not a candidate, and was not out campaigning, his party would be weaker than it was a year ago.

Secondly, there has long been noted in American politics a phenomenon known as "off-year reaction"—a tendency to vote against the party in power. President Truman felt this in 1946, when the country presented him with a Republican Congress. Two years later (1948) it returned a Democratic Congress, along with Mr. Truman for another four-year term in the White House.

So the recent results in Wisconsin and New Jersey are obviously indications of this traditional off-year backswing. The surprising fact is that it took place so early. The reason may lie in the fact that the voters were "against" something. Discontented voters appear at the polls with greater regularity than contented voters. This tendency to vote against the "ins," therefore, can be expected to show up on a proportionately larger scale during an off-year than in a national election year, when everybody and his brother go to the polls.

But the third point is the real reason why Chairman Hall said the administration is in trouble. So far it has not lived up to the hopes of its supporters or the promises of its campaign. What promises? To keep the farmer happy. To keep the labor unions happy. To reduce taxes. To stabilize or cut consumer prices. Some of these objectives are mutually con-

REA Approves Loan in Indiana

The Rural Electrification Administration approved one telephone loan during the week of Oct. 26 to 30. Details of the loan follow:

Perry-Spencer Rural Telephone Cooperative, Tell City, Ind., $578,000, to finance the improvement and extension of rural telephone service in Perry and Spencer counties.

The nucleus of the cooperative system will be the following telephone properties: St. Marks Telephone Co., St. Meinrad Telephone Co., Lamar Telephone Co., and certain properties from the U. S. Forest Service. These groups are presently providing dial and magneto service to 616 subscribers from 161 miles of line.

The loan funds will also be used to construct 147 miles of new line and to rebuild 99 miles of the acquired line. Dial central offices for the new system will be located at: St. Marks, St. Meinrad, Lamar, Bandon and Derby. Plans are being considered for service without toll charge between some of the borrower's exchange areas, and for similar service between a few of the areas and their nearby trading centers.

The rehabilitation and extension made possible by the loan will enable the cooperative to bring improved service to the existing subscribers and initial service to 632 unserved rural families.

The completed system will consist of 286 miles of line.

tradictory, especially in the case of keeping both the farmer and the consumer happy about prices. But that is what Ike's crusade promised and, so far, there has been no delivery — therefore no political payoff.

Do these three points suggest that the Republicans are all through? Do they indicate that the Democrats will win control of the next Congress and that Ike will have a Democratic successor in 1956? Not necessarily, if we analyze point No. 3 above. Thus far the Republicans have been preoccupied with staffing many agencies, reducing expenditures, thinning out the Federal bureaucracy and laying the ground work for future policy making. This is all foundation work. And it is very unpopular foundation work with those people who have to get out of fat jobs. Foundations are never pretty in themselves, however essential they may be for the eventual construction work.

The next session of Congress will tell the real story. And it may be part of Ike's party timing to defer the delivery of some promises to a time nearer the elections in 1954 so as to keep the voters' memories fresh. Automatic income tax reduction was deferred, it will be recalled, for six months—until the end of this year. There may be further reductions in personal income taxes next year. There is time enough to deliver on these things if the Republicans in Congress do not fall to quarreling among themselves as they did at the last session.

The Eisenhower administration seems to need two things to carry out these promises in the next session of Congress and make them stick with the voters in time to have any effect in 1954, or more important in 1956. One is a little more aggressive leadership to knock some heads together in Congress and get some bills on the statute books. Another is a little more showmanship or what might be called in the public utility business, "public relations." The present administration has been on its dignity long enough. Keeping promises is essential, but letting the voters realize they have been kept is even more essential.

The late President Roosevelt well understood the need for promotional razzle-dazzle in the course of his early New Deal reforms. The Republicans could well use the skillful talents of such a political carnival man as James Farley in his prime. In short, the Republicans — assuming laws can be passed to carry out campaign promises—have an exceedingly difficult and demanding promotional job to do with the voters. Many constructive and worthy programs now in the making are simply not understood. Nobody has bothered to tell the people what is being accomplished or what is in store on a scale and in a manner which will surely register with the average citizen.

Summing up, it would appear that the recent Democratic victories could be a timely warning to the administration. The people expect more than has been given them to date. Maybe some people expected too much or expected the impossible. But a disenchanted voter's ballot counts just as much as the more reasonable voter's ballot, when they add up the score after the election booth closes.

It would be presumptuous to attempt any final judgment on the basis of the scattered elections of 1953, but they do suggest that Ike is going to have to shake up his team and turn in plenty of effort if he expects that the country will eventually turn back to the Republicanism which predated Roosevelt.

As one cynical Republican congressman, who seems resigned to the GOP losing congressional control in 1954, told your correspondent: "Well anyhow the place will get four years of airing out. That ought to help some."

Area Dialing Comes to Washington

Beginning Nov. 8, in the nation's capital, local telephone subscribers could sit down at their telephone and dial numbers in Baltimore and vice versa. This was the result of a vast increase in area dialing along the pattern being worked out by the Bell System in collaboration with Independent companies throughout the nation.

It is especially significant in the Washington area because of the rapid increase in metropolitan development, which is linking northern Virginia and the central part of western Maryland inextricably with the old outmoded 10-mile square laid down by George Washington as the boundary requirements for the District of Columbia. Not only Baltimore (36 miles from the White House), and Annapolis (30 miles) and Frederick (42 miles), but a host of other Maryland and Virginia communities have been brought together, on the new wider area dialing system which dispenses with the need for a living operator to make the connection.

This trend is nothing new to telephone people in other sections of the country, especially on the West Coast where the absorption of satellite and suburban communities into metropolitan exchange areas has been even more rapid. But the "historic 40 miles" (the former distance by highway between downtown Washington and Baltimore) is rapidly being turned into a continuous chain of communities, which eventually will seem like a continuous city.

Only last month, Maryland highway authorities announced plans for creating an entire new city of 50,000 population midway on a new superhighway which will connect Washington with Baltimore. This "new city," as yet unnamed, is now located in the middle of open corn fields and tobacco plantings in the vicinity of Fort Meade, Md.

It goes to show that the telephone companies of the United States, in laying their plans for technical operations, are thinking well in advance and along accurate lines of projection as compared with actual physical growth trends of the future.

Government Limited

"I believe that there are certain fields in which it is quite necessary that governments shall take over and carry through certain developments, but I do not believe that a new industry—one where development must be made —is the proper type where this should be done. . . . I believe that returning the atomic energy development to the private enterprise people is, in fact, the most effective way to get this subject developed."—HAROLD C. UREY, *atomic scientist.*

V V

Michigan Bell to Inaugurate Regional Dialing Plan

The Michigan Bell Telephone Co. has announced it will inaugurate a regional dialing plan for its Detroit customers on Dec. 13.

Under the plan, Detroit subscribers will be able to dial direct to more than 60 communities in southeastern Michigan and to several adjacent Canadian points.

As additional exchanges in the southeastern section of the state are converted to dial operation, or are changed over to a seven-digit numbering system, they will be included in Detroit's regional dialing area. Among the larger exchanges to be added to the plan next spring are Flint and Monroe.

V V

"It was private capitalism which made this nation strong and great, and without which dictatorship, tyranny and decay are just around the corner."—Marion (Ind.) *Observer.*

A field engineering crew sends a balloon aloft at proposed microwave station site. When balloon rises high enough to be seen by observers on distant mountain, height of antenna tower required can be determined. (Photo by Southern Pacific Railroad.)

Principles of

MICROWAVE OPERATION

by HAROLD B. McKAY

PART III

THIS is the third and last article in this series discussing the fundamental principles of microwave operation. The preceding two installments were published in the Oct. 31 and Nov. 7 issues.

Planning a Microwave Installation

The first thing needed in the planning of a microwave installation is information concerning the topography of the region to be served. This information should include elevation of the ground along the proposed route and the location of existing roads. This data can be shown on a topographic map and the location of the existing telephone plant should also be shown.

Topographic maps for many parts of the United States and its possessions are available from the United States Geological Survey, Washington 25, D. C. or Denver, Colo. An index map, showing the available topographic maps for your state, can be obtained free of charge from the Geological Survey. Requests for maps of eastern states should be sent to Washington. Maps of the western states are available at Denver.

If a map of this type is not available for the area desired, maps may often be obtained from the local county engineer, survey or highway department. After securing an adequate map, the terminals of the telephone circuit to be placed should be noted on it.

Traffic

A microwave system, like a carrier land-line system must be reckoned with on a circuit mile basis. That is, the cost of the system must be considered in connection with the number of channels it will provide. Therefore, a traffic study, based upon past and expected future use, should be made. Just as a pole line can start with a pair of wires and later have many more added, a microwave system may be installed initially with only a few channels and later increased.

In this connection, it should be noted that increasing the capacity of the microwave system requires only the addition of channel equipment to bring the installation up to its limit. No addition is required to the radio part of the system, and the initial cost of this part of the layout will not be duplicated.

It is, therefore, quite practical and economical to install a minimum number of channels if the traffic survey indicates that this may be desirable. The maximum number of channels in a system varies with the type and manufacture. Each channel may require a

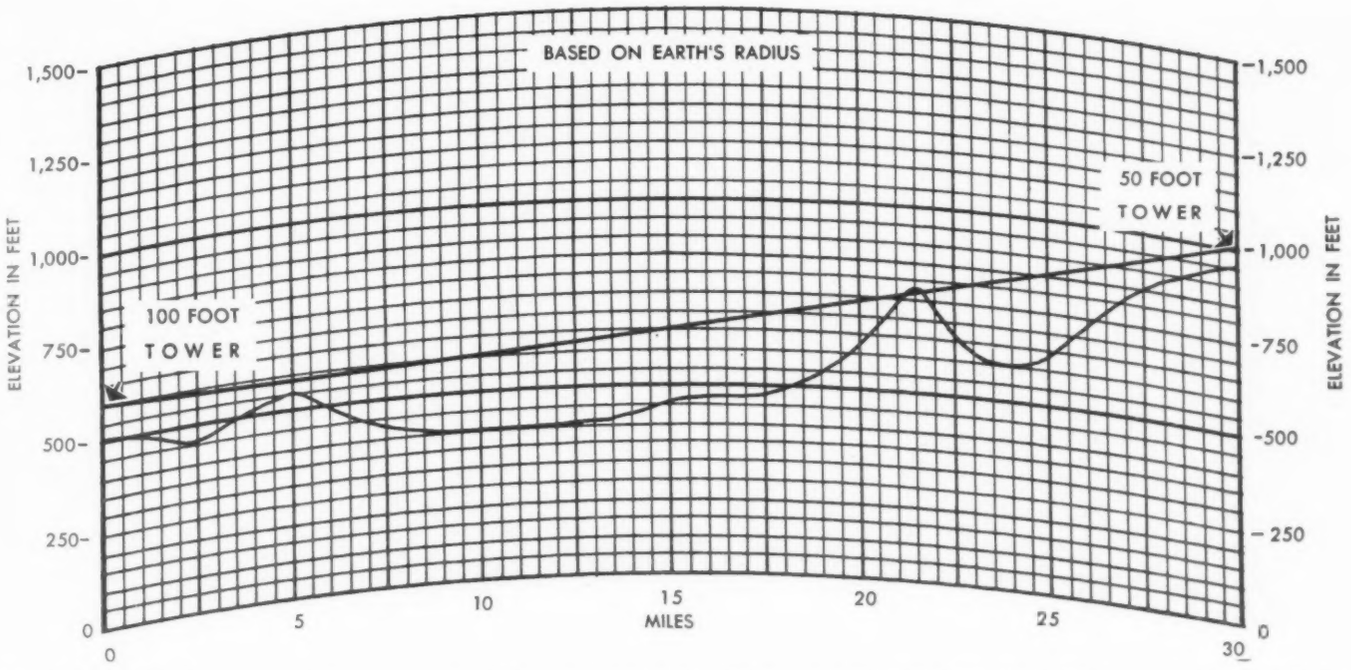

Fig. 1. Profile chart of proposed microwave route showing ridge interfering with line of sight. Charts like this, which are prepared by engineers, are useful in determining if a tentative route is practicable, or how high towers must be in order to clear obstacles.

band-width of four or five kilocycles, depending on the carrier equipment used. Some systems have modulation band-widths of 150 and 300 kilocycles. Up to 60 channels are handled by some equipment.

Should future growth ultimately require more channels than the maximum provided in the system used, a parallel microwave route using a slightly different frequency can be used. While growth of this sort would require additional radio as well as carrier channel equipment, additional power supplies, buildings and access roads would not be necessarily duplicated.

In addition to a traffic study, a commercial survey might be in order. With the microwave system, it might prove practical to serve areas not now reached. An example of this might be a resort area which has not been served in the past because of its seasonal nature, remote location, difficult terrain or distance from existing land lines. Radio microwave equipment can be set up on a temporary basis to serve such needs.

Other utilities or companies with extended plant might well be contacted as potential customers for the service. It might also be an advantage to pick up rural subscribers somewhere along the line who do not have service at present.

Plant

From a plant viewpoint, the microwave system, in addition to providing

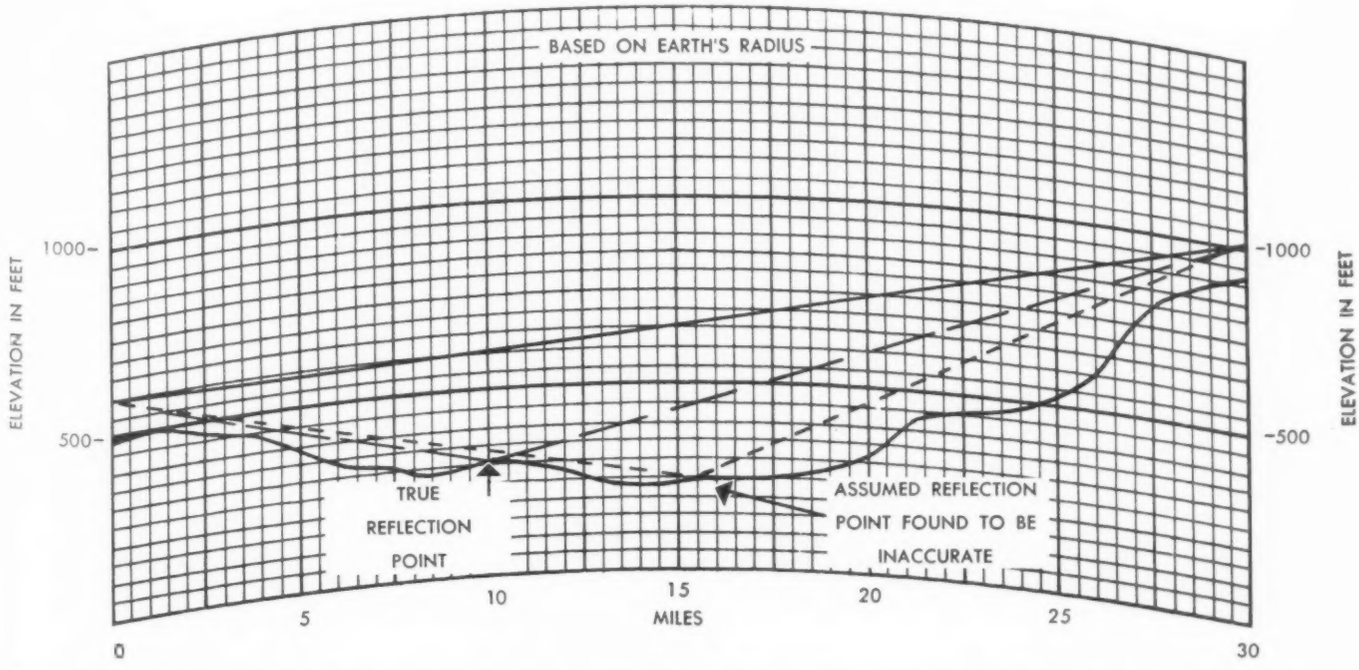

Fig. 2. Possible points of reflection can be located on a cut-and-try basis on a profile chart. An assumed reflection point is chosen, and straight lines are then drawn to each of the antennas from this point. The assumed point is the true reflection point if the two lines rise the same number of feet in going an equal number of miles to the right and left of the point.

new facilities, might make it possible to abandon unprofitable plant if the correct route is chosen. For example, while a system may be intended primarily to serve as toll trunks between two exchanges, it might prove possible to have it replace intermediate long exchange lines as well.

Therefore, when considering repeater locations, due regard should be given to the fact that a microwave system permits "drop-outs" to serve wire lines at repeater points. In practice this might mean that a system would start out from the office with 16 channels. Eight of them might drop out at the first repeater point to serve a small exchange or subscribers, while the rest of the channels continued on to a more distant point.

Considering all of these factors, a proposed ideal route should be planned. The next step is to reconcile the ideal plans with the practical considerations of the terrain. Because microwave requires that transmitting and receiving station be on a line of sight path, this usually means that the antennas must be placed at an elevated point.

This does not mean that mountain tops are required as sites. In level country the antenna might be placed on the roof of the telephone exchange. If the presence of other buildings blocks the line of view to the telephone building, other structures may be used. A taller building nearby, or a water tower may be available for the antenna location. One warning, however, is to stay off radio or television towers used by high-powered stations. In fact, it is good practice to locate a microwave antenna at least a mile away from such stations, because interference may result.

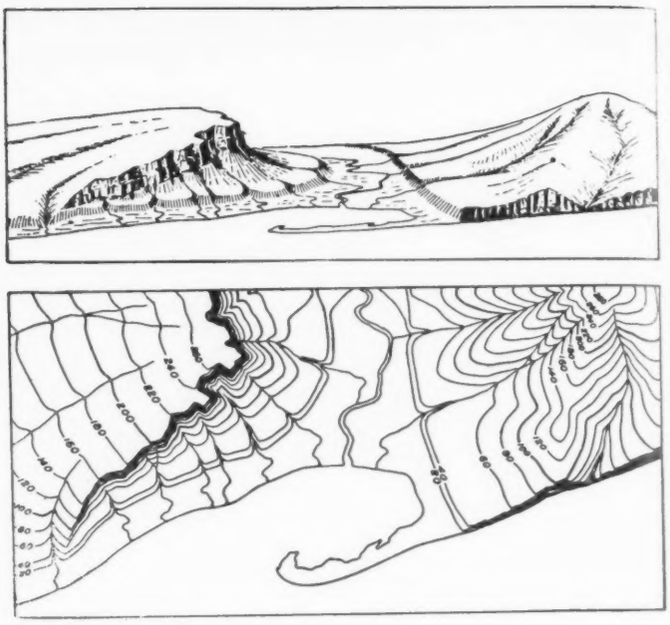

Fig. 3. Contour maps useful in planning microwave routes. The top illustration represents a view of an area of land. The bottom illustration shows how this same area would appear on a contour map. (Courtesy U.S. Dept. of the Interior.)

In some cases in level country, it is necessary only to erect a pair of poles on the outskirts of town to hold the antenna. If the central office building can be used, this, of course, is best. If the antenna must be located somewhere else, the associated radio equipment must be located with it, but the carrier portion may be in the central office.

This may mean that the construction of a small building will be necessary. Such buildings need only be large enough to house about three or four bays of equipment, with room for power equipment if required.

With the originating antenna of the system tentatively located, the next step is to plot the direction the signal must go in order to get to its destination. Consulting the topographic map, points should be selected which are in the direction desired and which will be in line of sight of the originating antenna. In actual practice, several alternate points may be chosen before actual field inspection starts.

LEFT PHOTO: Radio equipment which cannot be housed in the central office, as in the case of microwave repeater stations, is usually placed in small compact buildings like the one shown here. (Photo by RCA.) RIGHT PHOTO: Mountain States Telephone & Telegraph Co. TV relay terminal on Lookout Mountain near Denver, Colo. The television signal from Denver is relayed to Lookout Mountain some 3,000 feet above the city and re-transmitted over a television transmitter. While this is a television rather than a telephone installation, it illustrates how antennas are located to obtain an unobstructed path to the distant station. (Photo by Motorola.)

Four transmitters and four receivers provide a complete standby-equipped repeater station, as shown here. (Pacific Telephone & Telegraph Co. photo.)

Plotting the route is usually done with the aid of a profile chart (See *Figs. 1, 2* and *3.*) This is a specially ruled graph paper with curved lines, upon which the hills and valleys of the land can be drawn in profile. From this, a line of sight can be chosen. Graph paper of this type is available from the manufacturers of microwave equipment. The chart is based upon the curvature of the earth and the distance to the horizon for observers located at different elevations. An experienced engineer can often accept or reject a proposed microwave route on the basis of conclusions formed from such a chart.

In addition to showing the clearance for the microwave beam, the chart can also reveal the possible points of reflections. That is, a line can be drawn representing the direct beam from one antenna to the other. A line can also be projected from one antenna to a valley, thence upward to the other antenna. Several such reflected paths can be drawn, on a cut and try basis, until a "true" reflection point is found. A true reflection point is one in which the two lines rise the same number of feet in going an equal number of miles to the right and left of the point.

Reflection points are undersirable because the reflected wave can partially or completely cancel out the direct wave between antenna and cause fading of the signal. This is particularly important when the path lies over a body of water. In the case of streams, lakes or other small inland bodies of water, the situation may be avoided by changing the height and location of the antenna. Fading, if not too severe, may be corrected by the use of compandor equipment, by increasing the transmitter power, by using larger antenna equipment, or improving transmission line efficiency.

Paths that lie along coastal regions or across large lakes may be subject to even more severe disturbances if part of the path is over water. In addition to reflections from the water, reflections may occur from layers of air of different temperature or moisture content, which are frequently found in these regions. These layers of air may bend the microwave signal completely away from the receiving antenna and cause a complete fade-out. It is best to avoid such routes by building further inland, but if an over-water path is necessary, then the additional fading expected should be considered and planned for.

In tentatively locating a point for the first repeater station, as described above, it will often happen that an intervening hill is just below the line of sight. This will show up on the profile map. In projecting the radio beam, it will be found that the signal will just graze the top of the hill or structure between the terminal transmitter and the repeater. This is permissible if the clearance of the line of sight is 75 feet or more (in 900-megacycle systems) and if it is unlikely that a structure will be built, or trees grow up into the line of sight.

When a likely spot for the repeater station is determined by means of the profile map, the accessibility to the site should be considered. It should be noted how near it is to an existing road and what effort it will require to grade a new road in to the location. It must be borne in mind that the repeater station must be accessible for maintenance throughout the year.

Also to be considered is the nearness of the site to existing power lines and how much of a job it will be to bring the power in to the station. The matter of connecting into land telephone lines should be considered if this is part of the plan. On the basis of the foregoing, several acceptable spots may be indicated. In any event, several should be tentatively located for consideration to minimize field work, when inspection of the sites is made.

The distance between terminals and repeaters and between repeaters themselves will be governed by the terrain. The usual system recommended limit is about 35 miles for 900-megacycle equipment. In some cases, greater spans can be covered if conditions are such that little fading is expected and when lower fade margins can be allowed. Most systems use a spacing of from

(Please turn to page 39)

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

THE WRITER always enjoys visits with telephone plant men whom he meets at the annual USITA conventions. These men from various sections of the country always have a wealth of excellent ideas that they are willing to talk about at these meetings. If they would only write us about the things that they will talk about when we meet face-to-face, we could certainly make this page much more valuable and a real clearing house for plant ideas.

Frequently, too, these men take me to task for something I have written and describe a method which in their opinion is much better. I always welcome this criticism for everyone has a right to his own ideas, and certainly if we all thought alike, there would not be much progress in telephony.

While attending the recent meeting in Chicago, a plant man from a low-humidity area in the Middle West took me to task for stating that paper-insulated cable should not be terminated on a main frame, but that silk and cotton-insulated tipping cable should be used. This man stated that in his area, pulp-insulated cable proved more satisfactory for use in main frame termination than the textile-insulated variety. This was news to "yours truly," but after local conditions were explained, the method he had advocated appeared to possess merit.

It is believed that disagreement on solutions to plant problems may often be due to differences in peculiar local or climatic conditions characteristic of a certain area. When a problem is explained in general terms, it may not meet specific or peculiar requirements in every case without some modification.

We do make an honest effort at all times to be accurate and mention those subjects on this page that may prove the most useful to the greatest number. When we fail, please let us hear from you, for not only will we be glad to receive your letter, but you will be contributing to the progress of telephony at the same time.

• • •

Many Americans will be surprised to learn that an agency of Soviet Russia has a private telephone in the White House. This telephone is for TASS, the Russian News Agency, and is installed in the press room along with 40 telephones of American press associations and newspapers.

• • •

Soapstone conduit, extensively used by power companies on the West Coast for the past 26 years, has now invaded the telephone field and is attracting considerable attention and favorable comment.

This conduit is composed of cement, clay, and powdered soapstone mixed mechanically in controlled proportions and extruded under pressure over steel dies. The interior bore is perfectly round and exceptionally smooth. It is manufactured in 4-foot lengths with inside diameters of 2 inches, 3, 3½, 4 and 5 inches. The external circumference is octagonal for convenient stacking and tiering in the trench and eliminates the need for spacers.

This flat-sided octagonal duct was first used for telephone work in 1952, and has proved so successful that all soapstone duct, for power use as well, is now being produced in this shape.

Couplings, bell ends, adapters and bends are available to meet the needs of the various sizes.

• • •

The telephone got its military start 75 years ago when a 40-mile line was installed at Ft. Whipple, now Fort Myer, Va.

This early military application of the telephone came only three years after Alexander Graham Bell had reached a stage in the development of the instrument where one could "catch a word now and then," and about two years after the first conversation was held over an outdoor line 2 miles long.

General Myer, then Chief Signal Officer, voiced the opinion that "it gives promise of usefulness."

• • •

A recorded music service is now available to provide pleasant, planned programs of background music by the use of tape recorders. This music system is fully automatic, a single reel of tape being capable of playing up to eight continuous hours of high fidelity music without requiring attention. As many as 160 selections are contained on one reel without a repeat number.

Several types of continuous tape playback units are available. These compact machines can be hooked up to any existing sound system that is suitable for high fidelity music reproduction. Selections from a library of more than 6,000 numbers are available, and may be exchanged at regular intervals.

• • •

A new plastic coating may be sprayed on windows to provide protection against solar heat, glare and ultraviolet rays. This product is a thermoplastic, and tests show that it filters out up to 95 per cent of ultraviolet and 80 per cent of infrared rays.

The compound is also available in sheets which have similar properties and can be used in place of window glass.

Both products are translucent and are available in blue-green, light gray and frosty white. They are also weather-resistant and will maintain efficiency over a period of years.

• • •

A recently developed protective paint that consists of vinyl resins blended with plasticizers and high-boiling-point solvents should prove useful for many purposes in the telephone industry. This paint dries quickly by solvent evaporation to a smooth, hard plastic film. Once dry, it will not support com-

bustion and does not readily oxidize. It also resists checking and will not crack or peel.

It is claimed that this new paint provides an impermeable shield that protects against corrosive conditions, including chemical attacks and extremes in humidity and moisture. Physically, it resists abrasive action, erosion and rough handling.

It can be used on metal, concrete, brick, stone, plaster and asbestos board. It may be applied by brushing, dipping or spraying.

PLANT MAN'S QUIZ

by RAY BLAIN, Technical Editor

Q. What is the maximum voltage recommended for use in breaking down resistance cable trouble so that accurate location may be made?

A. One test set designed for this purpose provides a maximum voltage of 450 dc. This voltage is provided by connecting ten 45-volt radio type "B" batteries in series.

• • •

Q. When a main exchange storage battery is maintained by the trickle charge method, how can we be assured that it has adequate capacity to carry the exchange over a failure of the commercial power supply?

A. When a battery is properly maintained by the trickle charge method, it should be practically fully charged at all times. In this case, just about the full capacity of the battery is available for use in the event of a power failure. On dial systems, it is also common practice to cut in end calls, as required, when the battery is carrying the exchange to maintain the necessary voltage.

If you wish to determine the capacity of the battery, the chargers may be shut down to determine just how long the battery will carry the exchange under average load conditions. If the battery will not carry the exchange over a required period of time, then the installation of a gas engine operated emergency generator should be considered.

• • •

Q. What sized ducts are considered most satisfactory for use on an underground cable exchange distribution plant?

A. In general, all main conduit runs should be at least 3 inches and in view of the small cost differential, 3½ or 4-inch ones are preferable whenever large cables are involved. Lateral runs, such as from manholes to terminals or buildings, may be 2 inches, although the 3-inch size may also be used advantageously for this service.

Large cables may be easily damaged by pulling them through a small duct. As a rule, we prefer the 4-inch size for all main runs between manholes.

• • •

Q. What type of soap is considered best suited for making lather to be used in detecting leaks of gas in the location of cable trouble?

A. Any soap that will make a good thick lather may be used for leak detection. It is considered desirable, however, to use a special soap solution designed for this purpose. This soap contains a mixture of ingredients that produce tough bubbles required for accurate cable testing. This soap solution can be procured from any telephone supply house.

Even when this special soap is used, the surface of the cable under test should be heavily lathered. If the soap solution is spread too thin, some leaks may not be detected.

• • •

Q. What are the recommended methods for reducing the noise level in a manual switchboard room?

A. If outside or street noises prove objectionable, windows should be closed and ventilation provided by the use of fans and an air duct system. The provision of a cushion on plugs to prevent their clicking on the plug seats also proves helpful in reducing noise. If the cord well panels are not covered with linoleum, this feature may be provided to reduce cord weight banging.

Noise makers such as humming fans, creaking doors and squeaky chairs should be corrected. Linoleum or asphalt tile floor covering always proves beneficial. In extreme cases, it may also be necessary to place acoustic tile on the ceiling.

• • •

Q. We have some customers who still insist on the use of extra-long cords on their telephones. We discourage this practice because of maintenance difficulties but do not have a satisfactory argument to give these customers in every case. What do you recommend?

A. Why not encourage the use of one or more extension telephones? A plug and jack arrangement so that one instrument may be used in several locations might also convince the majority that an extra-long cord is not desired.

In a few cases when customers insist on the use of an extra-long cord, the retractable type is recommended as it will cause a minimum of trouble even in long lengths.

• • •

Q. Will it be possible to light a main frame in such a manner that troublesome extension lights need not be used for running jumpers?

A. Flourescent tubes, properly placed, provide a good shadowless light that should prove adequate for this purpose. Proper lighting is extremely necessary to insure correct soldering of connections.

• • •

Q. In the construction of an underground conduit plant for a cable distribution system, will it be necessary to encase cement-asbestos or fibre conduit in a concrete envelope?

A. When the thick wall conduit of either type is used, a concrete envelope is not usually necessary, under average conditions. When greater mechanical protection is considered necessary and the concrete envelope is used, a thin wall conduit available for this purpose will prove adequate.

• • •

Q. When a protected cable terminal is installed on aerial cable, can it be grounded to the messenger strand or should a ground rod be provided?

A. It is most important that this type of terminal be connected to a low resistance ground, if adequate protection is to be provided. If the strand provides this type of ground, then it will prove satisfactory.

A suitable clamp should be used to connect the ground wire to the strand. If necessary, a special fixture may also be procured for use in making a positive connection between the guy and anchor rod and reducing the ground resistance.

South Carolina Independents Meet

By R. C. RENO

THE TELEPHONE industry will face a greater demand for service and challenge in serving the American people than it has faced at any time in the past, and telephone companies cannot afford to get the idea that they are caught up with the service demand, or that the demand will diminish, C. B. Barksdale of Greenwood, S. C., stated in an address opening the annual convention of the South Carolina Independent Telephone Association. The convention was held Oct. 26 and 27 at Clemson.

Especially the industry will have to expand and improve service in the rural areas, Mr. Barksdale said. This will call for adoption of newer methods and techniques such as carrier and possibly microwave radio, he stated. Along this line, he predicted that, as the industry moves forward to meet the service demand of the public, much equipment judged to be modern today will become obsolete in the near future.

The reports of Association Treasurer R. E. Seymour and Secretary R. S. DuRant showed the association to be in good financial condition and the membership to be growing. Secretary DuRant reported that all but six companies in the state, eligible for membership, are members of the association.

The convention heard a report of the activities of the United States Independent Telephone Association from Executive Vice President Clyde S. Bailey of Washington, D. C. He reported on—

(1) The USITA's plan for a national advertising program to acquaint the public with the activities and scope of the Independent telephone industry. The plan has been approved by the USITA board of directors and it will be submitted to Independent companies for their approval or disapproval.

(2) Negotiations between representatives of the USITA and Bell System to arrive at equitable charges in connection with extended area service involving Independent and Bell exchanges.

(3) The pension plan for smaller Independent telephone companies arranged by the USITA directors in conjunction with the Chase National Bank of New York City.

(4) Promulgation of a simplified separations procedure for the use of small companies, upon which is based the division of toll revenues on traffic interchanged by Independent and Bell companies.

(5) Declaration of the USITA board of directors that toll compensation for Independent companies for traffic interchanged with the Bell System shall be based on the full cost of handling such traffic, plus a return on the equipment and facilities used to handle the business of not less than the rate of return asked by the Independent companies in connection with rate increases.

In an address before the convention, R. C. Reno, editor of TELEPHONY, commented on certain problems facing Independent telephone companies in connection with securing adequate rates, improving and expanding service, bettering public relations and building good plants, etc.

He termed these immediate needs and stated that he felt many of them would be diminished if attention were given to five basic needs of the Independent segment of the telephone business. Mr. Reno listed these basic needs as:

(1) Striving toward more aggressive, energetic and enlightened management

Officers and directors of the South Carolina Independent Telephone Association. Seated, left to right: S. S. HELMLY of Monck's Corner; C. B. BARKSDALE of Greenwood; R. S. DuRANT of Rock Hill, and BYRON WHAM of Williston. Standing, left to right: GORDON SAUNDERS of Sumter; A. O. BOLEN of Swansea; T. CARTER THOMASSON of Lancaster; H. W. ASKINS of Chesnee; F. S. BARNES of Rock Hill; W. D. WILKINSON of Greenwood; D. B. WHITE of Georgetown, and R. E. SEYMOUR of Greenwood.

Photos on this page were taken at the South Carolina convention.

in many small Independent companies.

(2) Attracting more young men into Independent companies — large and small.

(3) Working towards the establishment of straight telephone engineering and plant schools in colleges, technological institutes or trade schools, through which new and prospective employes, as well as present employes of telephone companies, can obtain instruction in telephony.

(4) Recreating the traditional "spirit of service" to the public which, in the early years of the industry, was built around the operators. With the gradual exodus of local operators, there has been a tendency for this service spirit to diminish. All employes in all departments of a telephone company must recapture the "spirit of service."

(5) Instituting a nationwide advertising program telling the story of the Independent industry—its vital place in the nation's telephone network and its important place in the economic life of the nation—as well as the problems confronting the industry.

"Training of Chief Operators" was the subject of an address by O. C. Tigner, South Carolina traffic supervisor of the Southern Bell Telephone & Telegraph Co.

Mr. Tigner stated that the training of chief operators is a responsibility of management which it cannot shirk, as chief operators have a great deal to do with the quality of service that is rendered by the telephone company. He recommended five steps in this training as follows:

(1) Making of a job analysis or a résumé of the activities that are involved in the chief operator's job.

(2) Making of a training analysis or analyzing just what additional information and training the trainees need.

(3) Planning of the training program.

(4) Execution of the program.

(5) Follow-up on the training program to see that it accomplished what it was set up to accomplish.

The last two features on the program were the showing of a film and a discussion on "Right-of-Way Brush Control" by Walter Gentner, chief botanist of the R/W Maintenance Corp. and American Museum of Natural History, and an address on "Plant Aspects of Inter-Toll Dialing" by R. M. Farmer, South Carolina toll plant supervisor of the Southern Bell Telephone & Telegraph Co.

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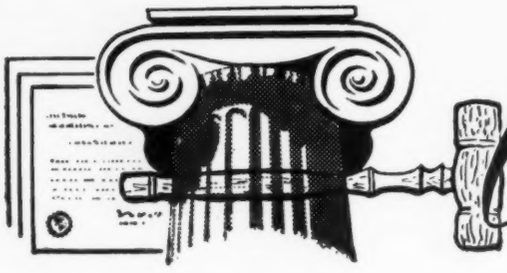


Courts and Commissions

Rate Change Approved for North Carolina Company

The Heins Telephone Co., Sanford, on Oct. 28 received permission from the North Carolina Utilities Commission to define, within the next 90 days, new base rate areas and apply new rate schedules which were approved last August.

Within this period, the company expects to convert service at its Sanford, Jonesboro, and Broadway exchanges to dial.

In approving the new rates in August, the commission ordered that it be given 90 days notice before the rates are made effective, saying that the change was granted with the understanding that dial facilities would be provided and service improved.

V V

Rochester (N.Y.) Company Seeks Stock Issue Approval

The first step in proposed financing for construction purposes has been taken by the Rochester Telephone Corp. with the filing of a petition with the New York Public Service Commission to issue 156,250 shares of common stock.

Sale of the issue would provide funds to retire current bank loans and money for construction the first two months of next year, it was reported.

V V

Cleaner Wins Suit Over Directory Listing

Thomas H. Woods, who hoped to be known in the Falls Church, Va., business community as "Dry-Cleaner Woods," won a $1.00 judgment on Oct. 15 in a district court because his preference was not listed in the classified telephone directory.

Mr. Woods complained he was entitled to $40,000 damages for the Chesapeake & Potomac Telephone Co.'s refusal to publish his business title in 1948 and 1949.

The cleaner contended that the company did include his business title in the 1950 directory and that this resulted in a $9,000 increase in business.

The company, however, insisted Mr. Woods had not been known as "Dry-Cleaner Woods" before 1950 and that it had the right to refuse to make a listing.

Judge Walter Bastian held that Mr. Woods would be entitled to only $1.00 in nominal damages even if the jury found the company's refusal to list was "unreasonable." Company lawyers then agreed to the $1.00 consent judgment.

V V

N. C. Commission Names New Accounting Assistant

It has been reported that Bruce M. Hurt, who has been an accountant with the Virginia Corporation Commission, on Oct. 28 was named assistant to the North Carolina Utilities Commission's accounting director, V. L. Choate.

Mr. Hurt, who will work under Mr. Choate's direction in preparing rate and statistical studies, fills the vacancy created last July when W. H. Cleland left the North Carolina commission's accounting department to join the Monroe (N. C.) Telephone Co.

V V

Michigan Independent Wins New Rates

The Hadley Telephone Co., was recently granted permission by the Michigan Public Service Commission to increase its residence and business rates.

Under the increase, residence rates will be raised about 50 cents and business rates will be raised $1.00.

Hadley Telephone has 245 subscribers.

V V

Idaho Company Files Rate Application

The Idaho Public Utilities Commission was to have held an Oct. 22 hearing to consider a rate increase application from the Parma Telephone Co.

The company is asking for an annual revenue increase of $7,461.

V V

North Dakota Rate Raise

The North Dakota Public Service Commission recently authorized a rate increase for the Sarles Telephone Co.

The new rates, which were effective Oct. 1, range from $5.00 for one-party business to $2.75 for two-party residence service.

Kansas Independent Given A $624 Rate Raise

An increase in rates for the Savonburg-Farmers Mutual Telephone Co. was approved on Oct. 28 by the Kansas State Corporation Commission.

The Savonburg company's 155 subscribers will be billed an additional $624.16 a year.

V V

Ohio Independent Requests Bond Issue Approval

The Lima Telephone & Telegraph Co. has asked the Ohio Public Utilities Commission to let it sell $750,000 in first mortgage bonds to help pay for improvements already made.

The bonds would mature in 25 years and pay 4⅛ per cent interest annually.

V V

Grant Interim Rate Increase to Oregon Independent

The Oregon Public Utilities Commissioner on Oct. 27 approved an interim rate raise for the Home Telephone Co., Condon, which will provide an estimated additional gross income of $1,793.28 and a new rate of return of 5.52 per cent. The company's rate base of $34,430 was figured on net plant in service less depreciation.

A final rate schedule is to be approved upon conversion of the Condon exchange to dial.

V V

MST&T in Further Hearings For Rate Relief in Utah

Hearings on Mountain States Telephone & Telegraph Co. rates recently were set for Nov. 19 by the Utah Public Service Commission.

The company, refused a sizable rate increase earlier this year, has asked the commission to determine a fair rate of return on its rate base and readjust tariffs accordingly (TELEPHONY, May 16, p. 29).

V V

Ohio Independent Asks $68,275 Annual Increase

A hearing on the Bucyrus Telephone Co.'s application for a rate increase was to have been held on Oct. 28 before the Ohio Public Utilities Commission.

The company is seeking a rate raise of between 20 and 25 per cent, amounting to approximately $68,275 a year, to offset higher operating costs.

An over-all increase of about 20 per cent was granted the Bucyrus company in August, 1951, with the provision that it make extensive improvements to provide better service.

V V

Two Georgia Companies Secure New Rate Schedules

New rate schedules for L. & B. Telephone Co., Chipley, and Public Service Telephone Co., Inc., Reynolds, were approved by the Georgia Public Service Commission on Oct. 19. The L. & B. company is seeking an REA loan; the Public Service company secured authorization for an REA loan on Oct. 19.

Approved rates for the L. & B. company were an interim increase pending conversion of its exchange to dial operation. The commission noted that the company intends to incorporate and obtain the REA loan in the near future in order to cut over to dial and to expand rural service.

The L. & B. company stated that present gross investment in telephone plant and equipment amounted to $16,106. From this was deducted a reserve for depreciation of $792, and to it was added $722 for cash working capital, giving a total investment of $16,036. Actual operating revenues were $8,610 and net income $150. Under the interim schedule, the commission estimated total operating revenues would be $9,896 and net income $1,100.

The following are the old and new rates:

One-party business	$3.50	$4.00
Two-party business	3.00	3.50
Four-party business	2.50	3.00
One-party residence	2.50	3.00
Two-party residence	2.00	2.50
Four-party residence	1.75	2.00

Under rates approved for the Public Service company, the commission estimated total operating revenues at $111,244 and net operating revenue at $27,552.

The commission in a separate order authorized the Public Service company to borrow $648,000 from REA; and also to issue 500 shares of $100 par common stock, the proceeds from the loan and sale of stock to be used for the retirement of present short-term indebtedness and for the expansion and conversion to dial of the Reynolds, Roberta, Butler and Lizella exchanges. The company's Culloden exchange is already dial-operated.

The commission order observed, "According to the evidence, it appears that some $693,792 of additional funds will be required and available to retire present indebtedness and complete the proposed telephone project. It also appears that estimated debt service requirements on the loan from REA will amount to $28,082 per annum, beginning three years from the date of the mortgage in lieu of some $26,000 per annum estimated by the company. . . .

"It appears that the above net operating revenue of $27,552, together with cash available from depreciating accruals will be adequate to meet fixed charges of the REA loan."

The following are the approved rate schedules, applicable when conversion and contemplated expansion plans are completed:

	Butler, Culloden, Reynolds, Roberta	*Lizella*
One-party business	$6.00	$10.65
Two-party business	5.00	9.40
Four-party business	4.00	8.15
One-party residence	3.75	4.90
Two-party residence	3.25	4.05
Four-party residence	2.75	3.25
Rural multi-party		
Business	4.75	4.60
Residence	3.75	3.00
For each additional 2 miles or fraction thereof beyond the base rate area, under rural multi-party	—	.25

The commission ordered that the above rates include extended area service between Reynolds and Butler; Roberta and Culloden, Lizella and Macon (Bell-operated).

V V

Two Pennsylvania Independents Plan 15-Cent Toll Charge

Two western Pennsylvania companies, the Midway Mutual Telephone Co. and the Murdocksville Independent Telephone Co., on Nov. 2 proposed a 15-cent toll charge between their Midway and Murdocksville exchanges, where they now have toll-free calls.

Based on calls by subscribers in both exchanges, the companies estimated that the proposed toll would raise revenues less than $100 annually for each.

V V

Sell North Dakota Company

The Wildrose (N. D.) Mutual Telephone Co. which was organized in 1915, has been bought by the Northwest Mutual Aid Corp., which operates in Williams, Burke, Divide and Mountrail counties. Northwest Mutual plans to rebuild the entire system, and convert to dial.

Massachusetts High Court Stays Commission Rate Order

A temporary rate increase for the New England Telephone & Telegraph Co. in Massachusetts went into effect on Nov. 4. The increase followed a decision of Justice Henry T. Lummus of the state supreme court staying a recent order of the Massachusetts Department of Public Utilities which approved an increase of 4.5 million dollars instead of the 10.3 million dollars asked by the company (TELEPHONY, Nov. 7, p. 36).

The stay allowed the company to put into effect the maximum figure, 10.3 million dollars.

The new increase will involve rate raises for all residence subscribers, it was reported. The company also said that some classes of business rates will not be increased, while special services such as PBX and other uncommon business services will call for higher rates.

Person-to-person calls, night rates and Sunday rates for certain toll calls within the boundaries of Massachusetts will also be affected by the new increase.

V V

Wisconsin Company Wins $7,000-a-Year Rate Raise

The Wisconsin Public Service Commission has authorized the Viroqua Telephone Co. to increase its rates to $7,000 a year, effective Jan. 1. (TELEPHONY, Oct. 3, p. 38).

W. E. Lawton, company manager, said the increase would amount to about 35 cents for one-party residence service and 90 cents for one-party business.

Present rates for one-party business service are $3.00; for one-party residence, $2.50.

Before the rate raise can be put into effect, however, the Viroqua company must grant salary and wage raises amounting to about $6,000 annually. This will be done, Mr. Lawton said.

The new rate increase will allow the company to earn a return of 6.5 per cent on its investment.

The Viroqua exchange was recently converted to dial.

V V

South Carolina Company Asks Rate Schedule O.K.

The South Carolina Public Service Commission recently scheduled a Nov. 24 hearing on a petition of the Lan-Caster Telephone Co.

The company has requested approval of a rate schedule.

Commission Approves Rate Raises for Two Ohio Companies

New telephone rates have been authorized by the Ohio Public Utilities Commission for the Hopedale Telephone Co.

William McCluskey, company owner, said he also has received approval of dial rates for the exchange.

The commission also approved a rate increase for the Bloomingdale Telephone Co., also owned by Mr. McCluskey, which will be converted to dial.

The Hopedale conversion to dial is expected to be completed in the next two years. Work is progressing on the cut-over from the present system, Mr. McCluskey said.

New rates for the Hopedale manual system are $4.25 for one-party business service; $3.25 for 10-party business; $3.75 for one-party residence, $3.00 for for five-party residence, and $3.00 for 10-party residence.

Previous Hopedale rates ranged from $1.50 to $1.75. The dial rates approved by the commission are $5.25 for one-party business; $4.25 for 10-party business; $4.25 for one-party residence; $3.50 for five-party residence.

V V

Dial Rate Schedule for New Exchange Approved in Georgia

Homerville (Ga.) Telephone Co. on Oct. 19 secured approval of a rate schedule, effective upon establishment of a dial exchange at Fargo.

Based upon an estimated 40 subscribers in Fargo when the exchange is cut over, the Georgia Public Service Commission figured total operating revenues at $4,627 and net revenues at $1,320. Estimated plant investment was noted as $27,100.

Rates approved for the dial exchange at Fargo are:

One-party business	$5.50
Two-party business	4.50
Four-party business	3.50
One-party residence	3.50
Two-party residence	3.00
Four-party residence	2.50
Rural multi-party	
Business, 0-2 miles	3.75
Residence, 0-2 miles	2.75
For each additional 2 miles or fraction thereof beyond the base rate areas	.25

V V

Maine Company Applies For First Rate Raise

The Maine Public Utilities Commission recently held a hearing on the application of The Saco River Telephone & Telegraph Co., Bar Mills, for a rate increase.

The 64-year-old company stated it had never asked for a rate raise before, and said it needs additional revenue from the increase which would raise basic rates from $1.50 to $2.00.

The Saco River company serves 850 subscribers on a magneto circuit in nine communities.

The commission took the petition under advisement.

"Hello, Mollie? I want to introduce you to a friend of mine."

V V

Indiana Company Goes Under Illinois Bell Management

Taking over the Crown Point (Ind.) Telephone Co. by the Illinois Bell Telephone Co. was authorized by the Indiana Public Service Commission on Nov. 5.

Illinois Bell, already principal owner of the Crown Point company, operates other exchanges in Lake and Porter counties.

V V

Apply for Mo. Purchase O.K.

The Missouri Public Service Commission on Nov. 2 received the joint application of H. M. Harned to sell and O.K. and Harriett Furr to purchase, the Koshkonong Telephone Co.

V V

Pennsylvania Company Asks Approval of Increased Rates

The Huntington & Centre County Telephone Co., Warrior's Mark, has asked Pennsylvania Public Utility Commission approval of an estimated $6,225 annual rate increase to be effective Dec. 1.

The company serves 629 subscribers.

Proposed changes are: One-party residence, from $2.50 to $4.25; multi-party, from $2.00 to $2.75. One-party business, from $3.50 to $5.00; two-party, from $2.50 to $4.00; and multi-party, from $2.00 to $3.50.

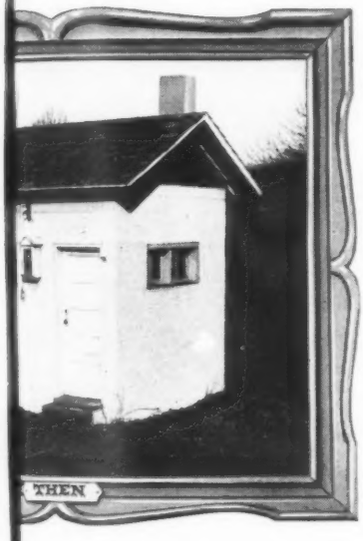
V V

Stock Split Approved in Oregon

Charles Heltzel, Oregon Public Utilities Commissioner, on Nov. 6 authorized the West Coast Telephone Co., Everett, Wash., to issue 680,000 shares of its $10 par value common stock

(Please turn to page 34)

years of growth!



At Nixon, Pennsylvania, a new Strowger Automatic exchange now replaces one which served dependably for *30 years*. The People's Telephone Company found that business had quadrupled during these years, and made the replacement only to provide more modern features—for the old equipment was still going strong!

Only Strowger Automatic can show such long records of actual service. And remember: *modern* Strowger Automatic is the result of Automatic's 60 years of Strowger switch development and constant search for new materials and processes. That's why the largest and most successful telephone companies use Strowger Automatic. They *know* it meets today's needs best—they *know* it will last for many thousands of tomorrows!

Most important to *you*, however, is the fact that when you buy Strowger Automatic, you know it will "deliver" on *your particular job;* the equipment you buy is tested in our factory under the same circuit conditions as exist in your exchange. Prepare for a secure and prosperous future. Write for a consultation with our engineers today.

and remember—

month by month

Strowger Automatic installations exceed all others

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of Telephone, Signaling and Communication Apparatus • Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

aggregating $6,800,000 for its presently outstanding 340,000 shares of $20 par common stock, on the basis of two-for-one.

V V

Florida Telephone Corp. Sells 10 Exchanges to Two Officers

On Oct. 29 stockholders of the Florida Telephone Corp., Ocala, approved the sale of 10 north Florida telephone exchanges to two of the corporation's officers, Otto Wettstein Jr., and his son, Otto Wettstein III, who will have their headquarters in Live Oak.

Otto Wettstein III resigned immediately as president of the Florida Telephone Corp., but his father remained as chairman of the board of directors.

The Florida Telephone Corp. had 28 exchanges in north Florida before the sale of 10, which are Live Oak, Alachua, Branford, Crescent City, Hastings, High Springs, Jasper, Lake Butler, Mayo and White Springs.

The new company, which plans construction of a modern plant at Live Oak, will make application to the Rural Electrification Administration for a long-term loan to finance construction of lines to 1,600 farm homes which have requested service, it was reported.

The Wettsteins also plan to convert all the exchanges in the new company to dial.

Earlier this year, Florida Telephone Corp. was denied a rate increase at a number of its exchanges because the Florida Railroad & Public Utilities Commission held that the company's service was too poor to warrant it. (TELEPHONY, Sept. 19, p. 29).

V V

Independent Asks Raise in S.C.

South Carolina Public Service Commission recently received the petition of the South Carolina Continental Telephone Co., Sumter, for increased rates. A hearing was to have been held on Nov. 3.

V V

Buys Pennsylvania Company

The Pennsylvania Public Utility Commission on Oct. 14 approved a proposal by the Luthersburg Telephone Co., Centre Hall, to purchase the Dayton Telephone Co. (TELEPHONY, July 25, p. 38).

V V

Ind. Bell to Buy Independent

It was recently reported that the Indiana Bell Telephone Co. has been granted tentative approval by the Indiana Public Service Commission to purchase the Gaston Home Telephone Co.

Pa. High Court Refuses Appeal Against Bell's Rate Increase

The Pennsylvania Supreme Court recently refused to hear an appeal against the 21 million-dollar annual rate increase granted last year to the Bell Telephone Co. of Pennsylvania. (TELEPHONY, Dec. 13, 1952, p. 33).

The Pennsylvania CIO council had asked the court to permit the appeal from a superior court decision upholding the commission's authorization of the rate raise last Dec. 1. (TELEPHONY, July 25, p. 36).

The cities of Pittsburgh and Philadelphia had joined the CIO in opposing the increase.

V V

Georgia Independent To Issue Stock

Georgia Public Service Commission on Oct. 20 gave authority to the Trenton Telephone Co. to issue 75 shares of $100 par common stock upon inception of the corporation.

Jules A. Case and Henry E. Gross recently bought the Trenton company from W. E. Tatum, who remains as secretary and treasurer of the corporation.

V V

AT&T Announces Third Quarter Results, Debenture Details

American Telephone & Telegraph Co. on Oct. 15 reported net income in the quarter ended Sept. 30 rose to $104,950,000, equal to $2.54 a share, from $89,899,988, or $2.51 a share, in the corresponding period a year ago.

Operating revenues fell slightly in the period ending Sept. 3. There was a sharp rise in income applicable to AT&T stock from earnings of the Bell System which is comprised of the parent AT&T and its principal telephone subsidiaries.

Earnings of the subsidiaries are included in the AT&T net income for the quarter only to the extent they have been received by the company as dividends, however.

About 400,000 telephones were added by the Bell System companies in the third quarter of 1953. The volume of toll calls was again larger than in the corresponding period of any previous year. The total number of telephones in the system has now reached approximately 40,800,000.

The Bell System in the three months ended Aug. 31 had a net income of $117,524,228, or $2.78 a share, compared with $97,930,514, equal to $2.68 a share, in the corresponding period of 1952. Of the total net profit, $114,276,668 was applicable to AT&T stock compared with $95,048,975 a year ago.

Operating revenues of the Bell system in the quarter ended Aug. 31 rose to $1,103,583,623 from $1,007,147,390.

* * *

Details of a new issue of convertible debentures approximating 600 million dollars were announced on Oct. 21 by directors of American Telephone & Telegraph Co.

The issue, Twelve-Year 3¾ per cent Convertible Debentures, were offered to stockholders of record at the close of business Oct. 30, 1953, in the ratio of $100 of debentures to each 7 shares of stock. The new financing was approved by shareowners in a special meeting on Oct. 14, and funds obtained will be used to construct additional facilities required to meet continuing demands for telephone service.

A prospectus and rights to subscribe for the new debentures were to have been mailed to each stockholder about Nov. 5. Rights may be used to subscribe or may be bought or sold or transferred to others. The subscription period for the debentures will end on Dec. 10, 1953, and rights will have no value after that date.

The debentures, which are to be dated Dec. 10, 1953, will be convertible into common stock beginning Feb. 9, 1954, at $136 per share, payable by surrender of $100 of debentures and payment of $36 in cash.

Getting Ahead

"If the young engineer would only keep in mind that management's principal contact, or opportunity to know about him, lies through the medium of the written or spoken word, he might regard it in its proper light—as a challenge and an opportunity to win recognition for himself by using the most clear and convincing plain English he knows."—R. A. GANTT, *member of board of directors, General Telephone Corporation.*

V V

Michigan Operator Feted

Miss Lulu Callahan, a telephone operator at the Adrian, Mich., exchange of the Union Telephone Co., Owosso, recently completed 35 years of service as an operator for the company. A banquet attended by 105 employes was given in her honor and she was presented with a white leather memory book outlining her years of service.

Arkansas Cut-Over Attracts 1,200

. . . United States Senator, Representative, Governor and state officials attend celebration. Barbecue held.

Part of the crowd of 1,200—almost three times the population of Bradley—that attended the dial conversion celebration and barbecue.

CITIZENS of Bradley, Ark., on Aug. 18, staged the biggest celebration Lafayette County has seen in years at the cut-over of the new Bradley unattended dial telephone exchange of the Walnut Hill Telephone Co.

Over 1,200 attended a barbecue at which Gov. Francis Cherry was the principal speaker. He placed the first call over the new Kellogg Relaymatic dial system to Louisiana Governor Robert Kennon at Baton Rouge, with both ends of the conversation being broadcast to the crowd as the call went through.

Businessmen of Bradley sponsored and promoted the celebration to express their appreciation to J. D. Garrett Jr., owner of the Walnut Hill company, for bringing them the latest in dial telephone equipment.

Up until less than three years ago the city had only 20 subscribers served by just one party line and three toll lines out of Lewisville. Today, the exchange is serving 175 subscribers, of which 75 are rural.

Mr. Garrett purchased the exchange seven and one-half years ago. In the first part of 1951 he installed a new magneto board, which has been replaced with the new dial system, and began extensive construction of outside plant.

Helping draw the celebration crowd of almost three times the population of Bradley, a small farming community just over the line from Louisiana in southwestern Arkansas, was an outpouring of some of the state's leading political figures.

Governor Cherry, making his first visit to the county, led a distinguished list of guests including United States Senator John L. McClellan, Congressman Oren Harris, former Governor Sidney S. McMath, State Senator Jack

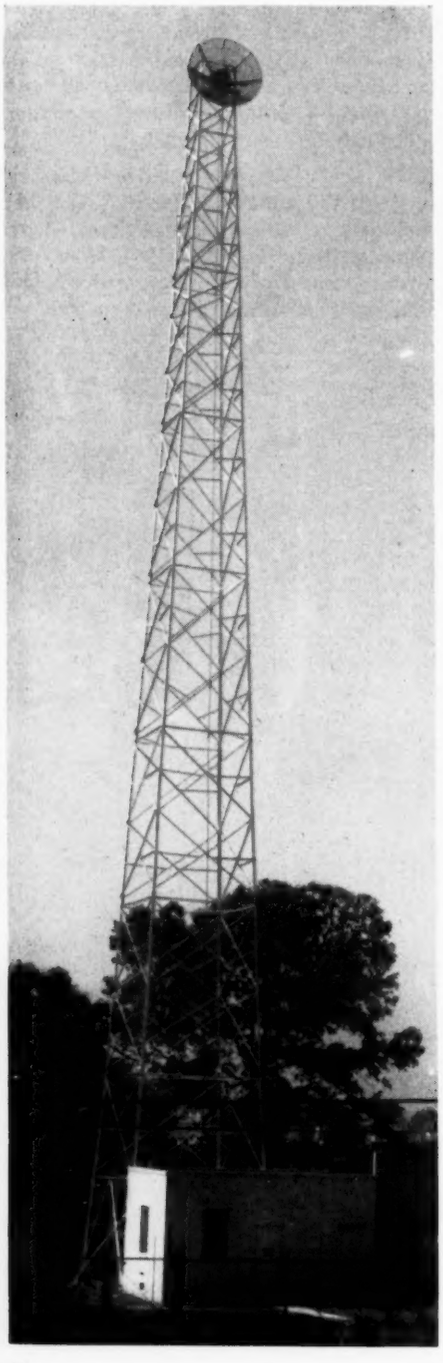
(Please turn to page 44)

SENATOR JOHN L. McCLELLAN (left) shown with MRS. J. D. GARRETT Jr., daughter, MARTHA GENE, and MR. GARRETT, owner of the Walnut Hill Telephone Co., in front of Mr. Garrett's new tile block dial exchange at Bradley, Ark. Senator McClellan installed heat coils to place the exchange in operation.

VIRGINIA INDEPENDENT

Adopts Microwave Radio

Tidewater Telephone Co., Warsaw, first Independent to connect toll system to Bell System facilities by Microwave.

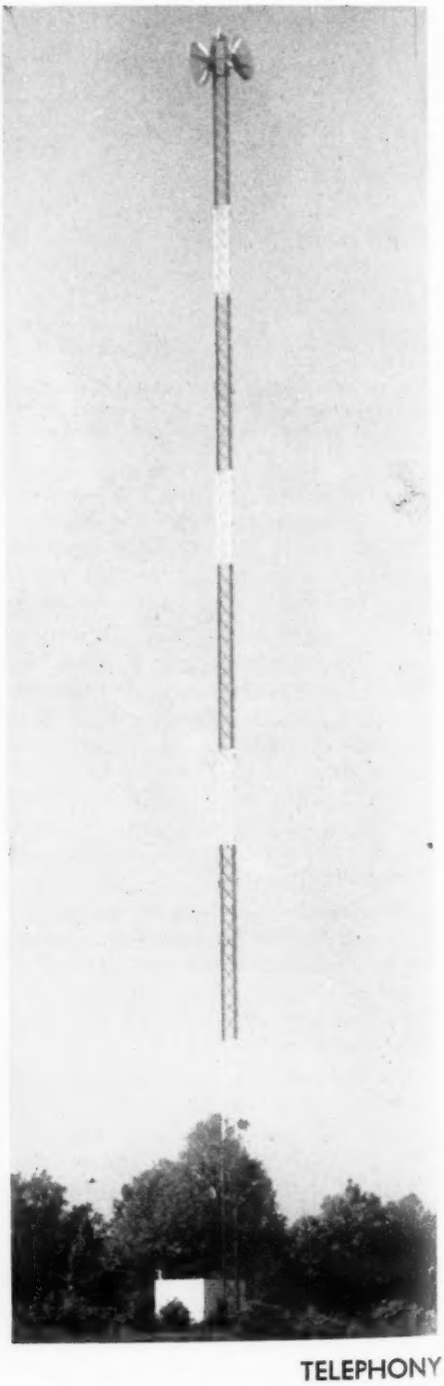


THE Tidewater Telephone Co. of Warsaw, Va., operating 22 dial exchanges in 13 counties of Tidewater Virginia, became the first Independent company in the nation to connect its toll system to the Bell toll system by microwave radio. On Apr. 1 of this year a microwave system was placed in service connecting the company's Warsaw toll center with the Richmond office of the Chesapeake & Potomac Telephone Co. of Virginia.

The order for this system was placed by the Tidewater company in 1952 and was installed in February and March of 1953. It supplements the company's previously existing facilities between Warsaw and Richmond consisting of 10 circuits using wire and carrier over a 50-mile pole line route.

The company decided upon the installation of microwave to provide additional circuits after a thorough study of the situation. In order to provide additional physical or carrier circuits it would have been necessary to install five miles of aerial cable from Warsaw to the Rappahannock River and 1⅛ miles of submarine cable to span the Rappahannock River to Tappahannock. The study disclosed that it was advantageous to use microwave to span the over-all distance between Warsaw and Richmond.

The system which has been installed by Tidewater provides 22 circuits.



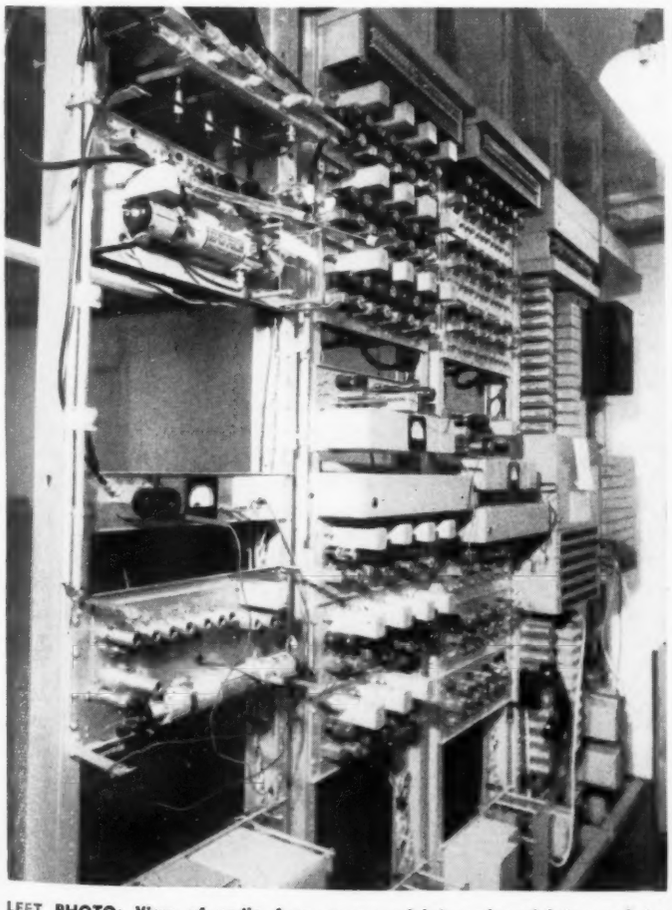
LEFT PHOTO: The 155-foot tower of the Tidewater Telephone Co. at Mechanicsville, Va., six miles from Richmond. This is junction point between toll facilities of Tidewater company and Chesapeake & Potomac Telephone Co. of Virginia. Terminal station building, which also houses terminal equipment of the Chesapeake & Potomac company, is of cinder block construction. RIGHT PHOTO: This square radio tower at St. Stephens, Va., is 280 feet high and is guyed four ways with a total of 16 separate anchored guys. The repeater station building also is of cinder block construction.

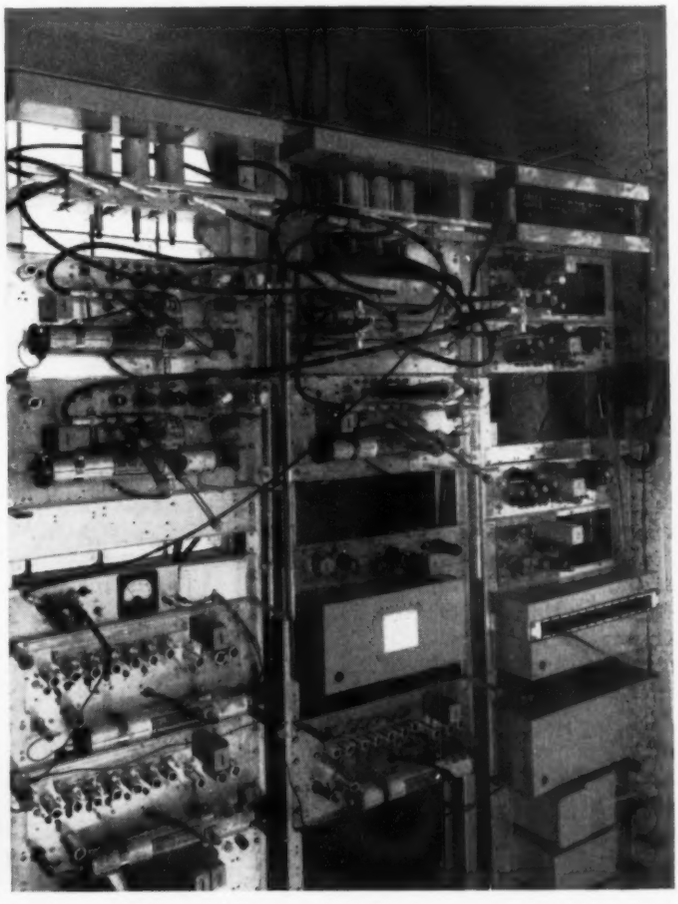
Three towers were installed ranging in height from 155 to 280 feet. One of these towers is located on the company's property at Warsaw and the 280-foot tower is located at an intermediate point at St. Stephens Church, Va. The other tower is located at the point of connection with the Bell System approximately five miles north of Richmond. From this point the circuits are extended into the Chesapeake & Potomac Telephone Co.'s Richmond office by cable.

The repeater station located at St. Stephens Church, which is the approximate mid point of the microwave system link, is equipped with emergency standby electric generator and standby RF equipment, both with automatic transfer.

According to a statement made by Rodney M. Coggin, president of the Tidewater company, the system has shown excellent results. Fidelity, transmission, reliability and maintenance costs have proved to be satisfactory. The company is now engaged in studies as to the advisability of installing additional microwave systems to provide its 12,000 subscribers with additional toll facilities. The company at the present time is operating more than 5,000 circuit miles of toll lines in its territory.

General office building of Tidewater Telephone Co. at Warsaw, Va. This office is a toll center for an area is served by 10 dial tributary exchanges. Toll circuits radiate from this office to Bell offices via wire lines, carrier and microwave. The microwave furnishes 22 circuits.





LEFT PHOTO: View of radio frequency, modulator, demodulator and terminal bays at Warsaw, Va. There is similar equipment at Mechanicsville. RIGHT PHOTO: Repeater station equipment at St. Stephens, Va., showing radio frequency bays equipped with 50 per cent radio frequency standby.

Those attending the recent Missouri Telephone Association district meeting at Macon are shown in the top photo, and the meeting at Cameron, the lower photo. At the meetings the association's small company assistance committees reported on their work to aid small companies, emphasizing that 300 assistance projects were carried out through the year. There were also plant and traffic conferences held during the meetings.

RCA Ready to Deliver Color TV Equipment Before End of 1953

The Radio Corporation of America announced on Oct. 26 that before the end of 1953 it will commence delivery of compatible color television equipment to enable stations across the nation to broadcast color programs in their areas.

The announcement indicated an early start for the first color television programs to be broadcast after the Federal Communications Commission approves standards for a compatible color system for television.

"One or more stations in 57 different cities have already placed orders with RCA Victor for color broadcast equipment—now in production," T. A. Smith, engineering department vice president, stated.

Mr. Smith said that deliveries of the first items of color equipment will begin in December. These items, consisting of color monitors and terminal apparatus to be added to existing TV transmission equipment, will enable stations to telecast programs received over telephone circuits.

RCA color television cameras and other equipment necessary for origination of color television programs in the stations' own studios will be ready for delivery beginning in March, 1954. Included are cameras for "live" broadcasts, slide and film equipment, and accessories, according to Mr. Smith. All of this equipment has already been fully tested during extensive experimental operations.

Last July, RCA announced that it was offering all stations an opportunity to place orders for color equipment. RCA plans to schedule deliveries of equipment for color broadcasting of network programs so that stations may make full use of telephone circuits adapted to handle the transmission of color signals, when they become available. RCA stated that, while plans have been based on orders already received, it believes that it will be able to make deliveries on new orders within a short time after initial orders have been filled.

V V

OBITUARY

FERDINAND TRAUTWEIN, 85, treasurer of Morrison (Ill.) Telephone Co., and active for many years as manager, died on Oct. 30. He had been in failing health for the past several years.

Ferdinand Trautwein was born on June 21, 1868, in Yorktown Township, Henry County, Ill. He was reared on a farm there and attended Hooppole Grove School. At the age of 26 he entered the general merchandise retail business at Yorktown, Ill.

In the latter part of 1896 he sold his business at Yorktown and moved to Prophetstown, Ill., where he engaged in trading. In the fall of 1897 he moved to Morrison where he worked in the retail business for some time.

Mr. Trautwein became connected with the telephone business 52 years ago, in September, 1901. In January, 1903, he took over the management of the Mutual Telephone Co. at Morrison. At that time there were three telephone companies, Whiteside-Harrison, Bell and Mutual. There were about five telephones in the rural district of Morrison and 100 in the city. Today there are 700 in the rural district and 1,050 in the city, and the company serves a total of 3,900 subscribers.

His first efforts after assuming the management of the Mutual Telephone Co. were to take over the Bell company, which he did after several months.

After this, the present Morrison Telephone Co. was formed.

J. A. Riordon, elected president of the company in January, 1915, and Mr. Trautwein, at that time began a stepped-up program for improving the Morrison Telephone Co. and giving its subscribers better service.

He was a life member of the Independent Pioneers Telephone Association and also of the Telephone Pioneers of America.

Surviving are his widow, Lillian Morse; one daughter, Mrs. Alene Haines; and granddaughter, Margaret A., both of Morrison; one brother, E. C. Trautwein of Winfield, Kan.; four nieces and two nephews.

V V

"The whole freedom of man consists either in spiritual or civil liberty"—MILTON.

PRINCIPLES OF MICROWAVE

Continued from page 23

25 to 35 miles, although rugged terrain or peculiar weather conditions might dictate shorter spans.

A word of caution should be noted here. It is not wise to try to stretch the limits of the system, even though experiments with portable apparatus may indicate that the limits can be exceeded.

For instance, let us consider the matter of grazing past intervening obstacles. In many cases, the microwave beam will bend slightly as it goes over a hilltop, due to diffraction and reflection in the atmosphere. Thus, it may be possible to get a signal through, even though the receiving station is below the line of sight.

This is risky business and a change in weather may cause the system to fail. No microwave installation should be made until a reliable engineering survey has determined the equipment and locations needed for dependable service. It is well to remember that a grade of service which might be acceptable to a pipe-line company might not be satisfactory to a telephone company, considering the latter's obligation to provide service to the public.

Field Surveys

When acceptable sites have been tentatively located, a field party usually surveys the actual location to verify accessibility, availability and line of sight conditions. In the daytime, field engineers frequently use mirrors to reflect flashes of sunlight to an observer at a distant point, and thus determine line of sight paths.

In wooded sections, a small balloon is sometimes used. This balloon is sent aloft on a marked cord while another party at a distant point, watches for it with field glasses. The two groups of engineers are in communication by portable radio. When the distant party sees the balloon, they notify the team which sent it aloft. From the amount of cord paid out, it can be determined how high a tower would have to be if placed at that location.

At night, field parties may use a sealed-beam, six-volt automobile spotlight for signaling. In clear weather, this type of lamp can easily be seen over the distances involved in this work.

Such a field trip also determines the access problems and the road requirements. Similar mapping and inspection activities will be required for each of the repeater stations necessary to complete the route to its destination.

Continuity of Service

Telephone companies are expected to maintain continuous service, therefore, the reliability of microwave is an important factor. Radio, of course, like everything else can have its failures. How these failures are provided for depends upon other factors. If an alternate route exists, failure of the microwave system might be tolerated for the length of time it takes to get it fixed. If this is not the case, standby, or duplicate equipment, should be considered.

If the area is subject to power failures, standby automatic-start gas engine equipment might be indicated. In case of radio failure, two courses are possible.

A standby radio receiver and transmitter may be used, with automatic switchover relays. This standby equipment would probably consist of the radio equipment only, hence it would not cost as much as the primary radio-carrier equipment.

Where the system is large enough to use two transmitters and receivers in regular service, the circuits can be divided so that if one microwave unit fails, only half of the circuits will be out of service. It is significant, however, that microwave is not subject to the hazards and outages of land lines. In fact, one of the best arguments in favor of this service is its reliability and low maintenance costs. It has the advantage of consisting of only three or four units at individual locations, which with the exception of the antenna are housed indoors, virtually immune to the weather.

A pole line on the other hand, may travel over devious, hazardous routes; along highways, through plowed fields, near or in the water. It is much simpler to reach the single point of possible trouble in a microwave system than to repair a storm damaged pole line. Thus, maintenance costs are much lower and outages can be restored more quickly with microwave than with land lines.

Maintenance

A typical microwave link performs with a small amount of regular servicing. Round-the-clock requirements for numerous maintenance personnel do not exist. The equipment is simple to maintain and requires a minimum of test equipment. Circuits are similar to ordinary radio and carrier equipment and only light hand tools and portable bench-type test equipment is needed for servicing.

Most personnel, capable of maintaining carrier equipment or repairing radios, should require only routine training in order to be able to handle microwave equipment. Microwave circuits are simpler than those used in ordinary home television receivers. In many cases the installation and line-up of a new microwave system is all that is necessary to break in the maintenance personnel.

Operator Requirements

While regular telephone personnel are capable of maintaining microwave equipment, only those who hold a radio operator's license issued by the Federal Communications Commission (FCC) are permitted to work on a radio transmitter. This means that while the receiver, carrier, power or other parts of a microwave system may be maintained by anyone, only a licensed operator, or a person working under the supervision of a licensed operator, can do work on the transmitter portion of the installation.

In addition, the installation of a microwave system requires the procurement license from the FCC. Information and assistance in obtaining the station license is obtainable from the equipment manufacturers.

The operator's license, however, must be obtained by the person desiring it. He will be required to pass an examination on radio law and practical maintenance considerations. The nature of the examination is such as to determine that the applicant can really adjust a transmitter. The questions asked are more practical than technical. Any person with a good radio knowledge can pass this examination with a few weeks of study. A useful aid to one contemplating this examination is *Radio Operating Questions and Answers* by Nillson & Hornung. (This book may be purchased through TELEPHONY.)

This book contains all the possible questions asked by the FCC, with practical answers. However, it is not a text, and a preliminary radio knowledge is necessary. The FCC publishes a pamphlet which covers the same questions, but does not give the answers.

If a telephone company does not have a licensed operator (or if one is being trained), a standby operator may sometimes be employed. Many small police radio stations and others operate on this basis. Every radio transmitter requires a licensed operator when repairs are necessary. Therefore, a radio station of any type—broadcast or police, for example—which may be in the territory of the telephone company will have such an operator available. It may be possible, in some cases, to "borrow" this man when repairs to the

microwave transmitter are necessary.

Some manufacturing companies are setting up service organizations with the idea of sending out a licensed repairman when trouble develops. This could be a valuable service, but the telephone company should take due regard for the distance such a man would have to travel and how long it would take him to get to the job, whether or not a repairman is always available, and how much this service would cost.

Cost Factors

An investment in a multi-channel microwave system should be approached in the same manner as that in which a new wire or cable plant is approached. Because microwave can provide a large number of channels, the cost of installation should be compared with the cost of other facilities with the same channel capacity.

Over a new route, microwave can be planned with the thought that the initial investment—including cost of sites, roads and towers—is of the same nature as investment in a comparable land line facility. Growth of a microwave system is then almost exactly comparable to the growth of a carrier system on land-lines.

However, the cost of adding additional microwave channels is much less than the initial installation, even though additional radio and carrier equipment may be needed. The life of microwave equipment may be regarded as about the same as other types of central office equipment. The full advantage of microwave should be borne in mind, including flexibility, privacy, weatherability and ease of maintenance.

The actual cost of a system will, of course, vary with conditions. Cost of roads, buildings and leases of sites for repeater stations will vary with every job. However, the cost of a land-line can vary greatly also.

It is, therefore, impossible to make a guess about price that will hold true in every case. For this reason, most manufacturers will not quote a price until a survey of the location has been made. A field survey may become quite a project in itself. In surveying some radio routes where maps were not available, it has been necessary to fly airplanes equipped with radar over the route, in order to measure the terrain below.

However, the writer feels that an article such as this would be incomplete unless some idea of the cost of microwave systems is given. One company has furnished an estimate of $1,000 per mile for a 48-channel system. This figure is compared with a pole line costing $4,250 per mile. This figure was based upon a price of $125 per equipped pole, with 34 poles to the mile. Four pairs of wires plus transportation brackets, it was said, would bring the cost up to about $5,390 per mile. The additional cost for carrier equipment, which would be required with either the microwave or pole line, would be approximately the same in both cases.

It should be recognized that the above figures apply to a theoretical situation and may not be applicable in specific cases. It should also be noted that if fewer channels are required initially, the relative cost per channel will be higher, but the cost of adding channels later will be lower.

Should the reader require additional information, a wealth of published material is available from all of the manufacturers in the field. Readers with no previous experience with vacuum tube circuits can learn important details concerning amplification, detection, automatic volume control and other circuit aspects from RCA's Tube Handbook, which is available at about 50 cents from radio stores. While not a complete radio text in any sense of the word, it is most thorough in its explanation of vacuum tube functions and makes a good starting point for the study of radio.

The following publications, available from the Superintendent of Documents, Washington 25, D. C., may prove helpful to anyone contemplating the installation of radio equipment:

Study Guide and Reference Material for Commercial Radio Operator Examinations. Cat. No. CC 1.2: R11/4/951—(35 cents).

Rules and Regulations of the Federal Communications Commission:

Part 2—Frequency allocations and general rules, Cat. No. CC 1.7. Pt. 2—(20 cents).

Part 6—Rules governing public radio-communication services. Cat. No. CC 1.7. Pt. 6—(10 cents).

Part 13—Rules governing commercial radio operators. Cat. No. CC 1.7. Pt. 13—(5 cents).

Price List 82—List of Radio Publications—(Free).

The author wishes to acknowledge the assistance, in the matters of technical data and photographs, supplied by the following manufacturers: Lenkurt Electric Co.; Kellogg Switchboard & Supply Co.; Lynch Carrier Systems, Inc.; McElroy Mfg. Co.; General Electric Co.; Leich Electric Co.; Motorola, Inc.; Philco Corp.; North Electric Mfg. Co.; Stromberg-Carlson Co.; Radio Corp. of America; Prodelin, Inc., and British Insulated Callender's Cables, Ltd.

Acknowledgment is also made to Harry Lewenstein, who was kind enough to check the manuscript for technical accuracy.

SOUTH CAROLINA INDEPENDENTS

Continued from page 27

Directors re-elected by the convention are Charles Bell of Chester; T. Carter Thomasson of Lancaster and Byron Wham of Williston. Three new directors were elected in accordance with an adopted amendment to the association's by-laws, increasing the number of directors from nine to 12. The new directors are S. S. Helmly of Monck's Corner; D. B. White of Georgetown, and W. D. Wilkinson of Greenwood. Other directors are H. W. Askins of Chesnee; C. B. Barksdale of Greenwood; F. S. Barnes of Rock Hill; A. O. Bolen of Swansea; S. A. George of Lexington, and Gordon Saunders of Sumter.

The directors elected the following officers: President, Mr. Wilkinson; vice president, Mr. Wham; secretary, R. S. DuRant of Rock Hill, and treasurer, R. E. Seymour of Greenwood.

V V

General of the Southwest Makes Two Organizational Changes

Two additional organizational changes in the staff of the General Telephone Company of the Southwest, San Angelo, Tex., became effective on Oct. 15, when R. Parker Sullivan was

R. P. SULLIVAN

named operating vice president, and Clarence A. Martin Jr. was appointed general traffic superintendent replacing Mr. Sullivan.

Mr. Sullivan fills the position which

Service Experience Proves

TELEPRENE®

DROP WIRE

Lasts Longer

More than seven years ago the first Whitney Blake Teleprene Drop Wire was installed in an area where weather conditions are severe. Since then, millions of feet have gone into service in all types of localities.

Failures of drop wire due to weathering and abrasion have been practically eliminated where Teleprene has been used. Even more remarkable, so little deterioration is evident in the seven year old Teleprene that it is apparent its life has only begun! Teleprene's remarkable record should make clear to users of drop wire that it pays to install the best. The cost of the wire alone in a drop loop is only 20% to 40% of the total. Since installation costs so heavily outweigh wire cost, a small apparent saving in original wire cost can never compensate for increased frequency of replacement.

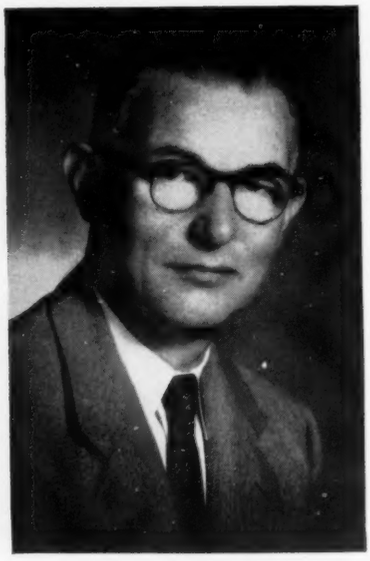
Therefore, it pays to get the best drop wire — Whitney Blake Teleprene — the top-quality neoprene jacketed wire that, once installed, stays on the job year after year while "pretty good" wires require replacement.

For the most economical installed drops, make sure your crews install Whitney Blake Teleprene.

WELL BUILT WIRES ® SINCE WB 1899

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT



C. A. MARTIN, JR.

has been vacant since May of this year when W. G. Wright became president of the company. Mr. Martin joined the General Telephone System after 25 years of telephone experience primarily with the New Jersey Bell Telephone Co. and International Telephone & Telegraph System.

Vice President Sullivan became associated with what is now General Telephone Co. of the Southwest in March, 1951, and has served as its general traffic superintendent since that time. He was connected with the General Telephone System, however, throughout his telephone career which began after his graduation from the University of Notre Dame in 1937.

He was assigned to the plant department of the Lexington Telephone Co. (now General Telephone Co. of Kentucky) at Lexington until 1941. For the next two years, he was with the Wisconsin subsidiary as a toll line and traffic equipment engineer.

In 1944 Mr. Sullivan transferred to what then was the Indiana Associated Telephone Corp., serving as traffic superintendent until 1945. He then returned to Kentucky to be that company's traffic superintendent. He served in that capacity until the company appointed him plant superintendent in 1950.

Mr. Martin has been affiliated with the International Telephone & Telegraph System since 1946, first as traffic staff representative and then as project engineer for Federal Telephone & Radio Corp., Clifton, N. J., in 1951.

He received his degree in Electrical Engineering from Cornell University in 1928, after which he joined the New Jersey Bell Telephone Co. as a traffic engineer. He served in this capacity until 1946 except for a two-year interval during World War II when he was on a wartime "loan" assignment to the Western Electric Co.

V V

100 Attend Wisconsin Association's Clinic

A group of over 100 Independent telephone men from northwestern Wisconsin recently took part in the second of a series of telephone clinics conducted by the Wisconsin State Telephone Association.

The meeting, which was held in Cumberland, Wis., was arranged and conducted by Ray J. Riordan, association secretary.

Host for the gathering was J. F. Benjamin, owner of the Cumberland Telephone Co.

Speakers and discussion leaders included the following: Association President T. H. Sanderson of the People's Telephone Co. of Rio; Mr. Benjamin and Julius Anderson, owner of the Clear Lake Telephone Co., who related their recent experiences with dial conversions; R. M. Rieser, Madison attorney, who told about efforts on the part of the Wisconsin Banker's Association to organize a banker's pool to assist in small business financing.

A. J. Quin, president of the Northwestern State Bank of Cumberland used the example of the Cumberland Telephone Co.'s recent experiences in borrowing money in explaining what is required of telephone companies to secure bank financing.

A. G. Kiesling, Madison CPA, who has been specializing in telephone accounting, told members of the clinic just how to assemble information for financiers in case they wanted to borrow money for improvements to their plants.

A. W. Raffill, state plant supervisor for the General Telephone Co. of Wisconsin, told the clinic about his company's experiences with non-metallic sheathed cable.

The association was to have conducted another clinic at Nielsville, in the central part of the state, on November 4.

V V

Boehm Named Chairman of Ohio Telephone Accounting Group

R. H. Boehm, comptroller of Ohio Bell Telephone Co., was elected chairman of the Ohio Council of Telephone Accountants at its annual meeting in Columbus on Oct. 28.

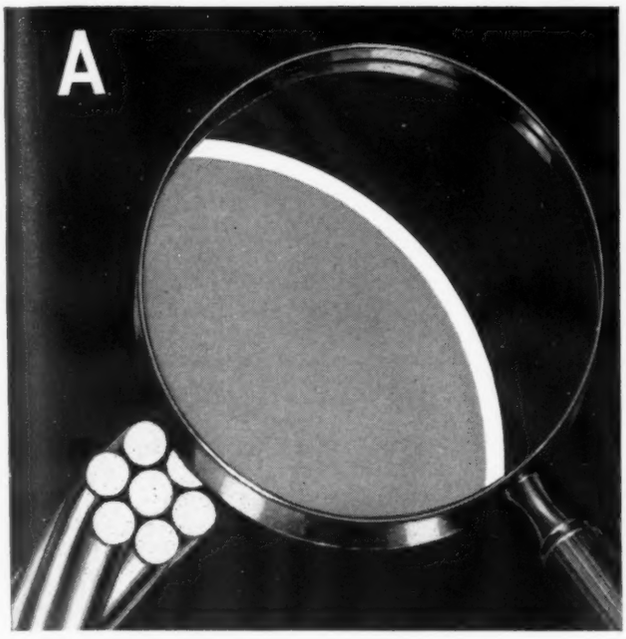
R. J. Maxwell of the Mansfield Telephone Co. was elected secretary.

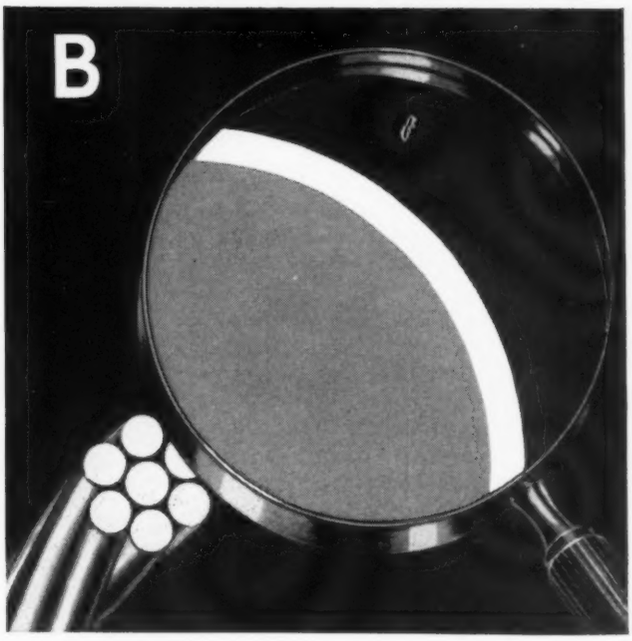
New directors are William Todd of the Northern Ohio Telephone Co., Bellevue, and R. H. Henderson of the General Telephone Co. of Ohio, Marion.

V V

"Most things are being over-produced in America, and some genuine study and research should be devoted to developing wider outlets, greater consumption, or new markets, and these can come by full employment, thrift and a national economy as free from regulation as possible." — Holbrook (Ariz.) *Tribune-News*.

Two views of a Pacific Telephone & Telegraph Co. employe applying to subscriber bills stickers calling attention to federal excise tax (TELEPHONY, Nov. 7, p. 38). Lower right: One of the stickers.





Which is the Better Coating- A or B ?

The answer is, "It all depends!" Does that sound like hedging? It isn't.

And furthermore, "better" in this case implies no difference in quality. Whether you choose Bethanized strand with an A coating or with a B coating, the quality is the same. Both coatings are highly-pure zinc, applied electrolytically. Here's the only difference: the B coating is twice as thick as the A, and therefore under similar conditions will last twice as long, though costing only a trifle more.

Where should each be used?

Let's put it this way. The A coating (equivalent in weight to extra-galvanized) certainly has its place; for instance, in cases where it will last as long as the other line components. But where pole structures and other items are designed for the longer-term jobs, then a strand with the thicker B coating is more feasible. *In other words, for greatest overall economy, match the life of the strand to that of the line as a whole.*

As a matter of fact, Bethanized strand comes with a still-heavier coating—called C—for extreme conditions. Thus it is virtually always possible to buy strand that will match the life expectancy of poles, towers, and other structural units.

For the full story, ask a Bethlehem representative to call. He will be glad to supply facts and figures that can be of real importance in your future planning.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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BETHANIZED STRAND

ARKANSAS CUT-OVER

Continued from page 35

Clark, State Representative Pat Robinson, State Senator Ellis Fagan, and members of the Arkansas Highway Commission and Arkansas Public Service Commission.

R. D. Tucker, Crossett, then president of the Arkansas Telephone Association, and Warren E. Bray, general manager for Southwestern Bell Telephone Co. in Arkansas, were also present for the event.

The Bradley American Legion Post served over 1,000 pounds of barbecued beef to the crowd attending the celebration and women of the city contributed cakes and pies by the dozen.

Mr. Garrett held open house at the new telephone exchange, following the barbecue, from 4 to 9 p.m. Two hundred and fifteen signed the guest book before a thunder storm struck at 5 p.m.

V V

Six TV Stations Added to Bell's Nationwide Network

The Long Lines Department of the American Telephone & Telegraph Co. announced on Oct. 19 that stations WKLO-TV, Louisville, and WTVH-TV, Peoria, Ill., were recently connected to the Bell Telephone System's nationwide network facilities.

Network programs for WKLO are fed from the transcontinental radio-relay route via Indianapolis, Ind. TV signals are picked up at the Louisville telephone company building and carried from there to the station's studio via a local link built by the Southern Bell Telephone & Telegraph Co.

Network programs for WTVH-TV are fed over the Chicago-St. Louis microwave route to an intermediate radio-relay station. From there TV signals are beamed to the station's transmitter site over a 3½-mile link provided by Illinois Bell Telephone Co.

Long Lines also announced that station WROW-TV, Albany, N. Y. broadcast its first network television program on Oct. 15.

Network programs for WROW-TV can be fed from either New York or Buffalo. The TV signals are picked up at a local telephone building in Albany and beamed from there over a 5-mile link provided by the New York Telephone Co. to the studio transmitter.

In addition to the above, two other television stations were recently connected to the Bell Telephone System's nationwide network facilities; they were WTRF-TV, Wheeling, W. Va., and KSTM-TV, St. Louis, Mo.

An announcement by the Long Lines Department said network service for Wheeling's first TV station was made possible by the construction of a new microwave link which interconnects with an intercity TV channel on the Pittsburgh-St. Louis radio-relay system.

Long Lines said network programs for the St. Louis station are fed from the coast-to-coast microwave route at Chicago over intercity facilities via Terre Haute, Ind. The TV signals are picked up at a Long Lines telephone building in St. Louis and carried from there to the KSTM-TV transmitter and studio over a local link provided by the Southwestern Bell Telephone Co.

Long Lines also announced that station WIFE, Dayton, O., has been interconnected with the Bell Telephone System's nationwide network facilities. Network service for Dayton's third TV station was provided over intercity facilities from Toledo, Ohio.

A local channel in Dayton, which connects the telephone building with the station's studio, was furnished by The Ohio Bell Telephone Co., Long Lines said.

With the addition of these six stations, network television service is now available to 210 stations in 132 cities in the United States.

V V

Two Northwestern Bell Employes Win Vail Awards

In Omaha, Neb., two persons who beat out the flaming clothing of a long distance telephone operator were rewarded on Oct. 29 for their action.

They are Mrs. Mildred Brierly, toll office service assistant for the Northwestern Bell Telephone Co., and Floyd D. Smith, American Telephone & Telegraph Co. testboardman.

Each received AT&T's bronze Vail medal, a check for $100 and a Northwestern Bell citation.

They were credited with beating out flames in the clothing of Jo Anne Wells last Mar. 23.

Miss Wells was having a cup of coffee in the company dining room on her relief period when she said "I feel warm." When she stood up her dress, which had been smouldering, burst into flame.

Making the award presentations were M. M. Loomis, Northwestern Bell's Nebraska area general traffic manager, and O. L. Dodge, division plant superintendent of AT&T's Long Lines Department in Chicago, Ill.

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With the Double
and America's
Exide-Manchex
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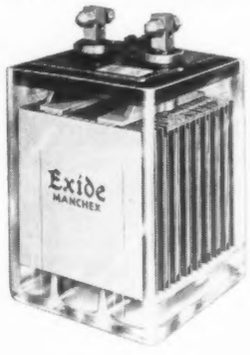

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jars permit compact space saving installatio
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provide extra conductivity for sustained vo
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rubber along with slotted plastic separator
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and low-cost maintenance use Exide Manche
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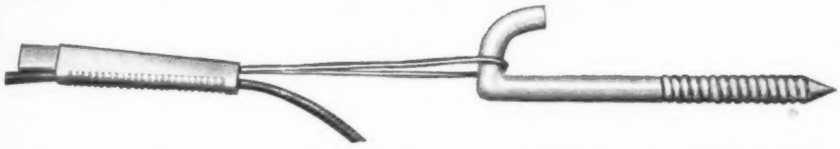
Guarantee of Stromberg-Carlson Leading Manufacturers . . .

reliable *drop wire clamps*



Manufactured by **RELIABLE ELECTRIC COMPANY**

Type "P" is designed for twisted pair or parallel drop wire to poles and buildings. Also available in Type "R" for resistance braid (heavy duty drop wire).

Reliable Drop Wire Clamps are unique in that they:

1. Prolong life of drop wires by permitting free swinging at the support, placing all wear on the hardware.
2. Permit stringing and sagging of service drops before cutting wire.
3. Automatically tighten under load, assuring a firm grip without damaging insulation.
4. Eliminate sharp bends in wire.

"Reliable identifies the quality"

the cook A-9u 7 amp. lavite fuse

For telephone men who prefer the best.

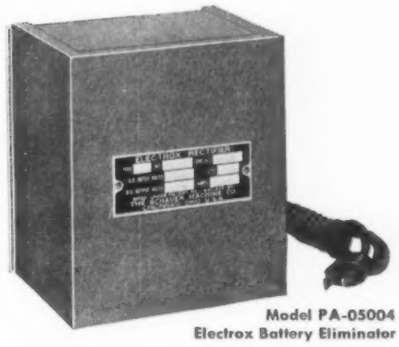
The Cook A-9u Lavite fuse is rated to blow on a 50% overload within 5 minutes.

This is in accordance with Underwriters' specifications and this fuse is listed with the Underwriters' Laboratories.

Cook also manufactures a full line of fuses carrying "Telephone Rating." These fuses blow instantly at their rated capacity.

Mfd. by Cook Electric Co.

24-hour guaranteed direct current, with electrox battery eliminator



Model PA-05004
Electrox Battery Eliminator

Designed specifically for the Operator's Circuit on Magneto Switchboards, the PA-05004 type illustrated guarantees current even if your AC fails!

When operating from 110 volt, 60 cycle lighting circuit, it delivers a constant, humless direct current. If the alternating current supply fails, a built-in Power-off Relay automatically transfers the operator's circuit to stand-by dry cells.

Other models available for Lamp Signal (PBX) and Automatic (PAX) systems. Products of Rectifier Division, Schauer Manufacturing Corp.

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QUIPMENT AND ELECTRONIC CARILLONS • INDUSTRIAL, INTERCOMMUNICATION SYSTEMS • TELEVISION, RADIOS AND RADIO-PHONOGRAPHS

Three operators of the Campbellsville, Ky., exchange of Southern Continental Telephone Co., Cookeville, Tenn., completed a unique record of service in September. Misses PAMELA, BERTHA and MARY RAFFERTY (left to right) marked up thirty years of service apiece—with never a day's work lost because of illness, in all that time. The Rafferty sisters began their telephone careers in Campbellsville, when they started working for the Taylor County Telephone Co., consolidated with the Southern Continental company in 1930.

Second Customer Toll Dial Site Planned for Birmingham, Mich.

The second community in the country to get customer toll dialing on a national scale will be Birmingham, Mich.

Clifton W. Phalen, president of the Michigan Bell Telephone Co., said that on Nov. 20, Birmingham will be tied in with the Bell System's toll dialing network to make it possible for subscribers there to dial more than 13 million telephones in 14 metropolitan areas throughout the country.

Customer toll dialing was first inaugurated at Englewood, N. J., two years ago.

Key to the Birmingham plan is the new 4A Toll Crossbar System recently installed in Michigan Bell's headquarters building in Detroit.

In addition to making it possible for Birmingham customers to dial many of their own long distance calls, the 4A system permits Michigan Bell operators to more than double the number of calls they can dial direct. The system also makes it possible for distant operators to dial through Detroit to reach telephones in many of the company's outstate exchanges.

V V

BOOK REVIEW

"ULTRA HIGH FREQUENCY PROPAGATION," by Henry R. Reed and Carl M. Russell. 562 pages. Price $9.50.

An outgrowth of studies made at the U. S. Naval Air Test Center in Patuxent River, Md., the new book presents the latest information on UHF wave propagation. The combination of theoretical and operational aspects of the subject makes it a volume for research physicists and radio operators, control tower operators, pilots, equipment designers, and installation engineers.

Since the authors regard the systems approach of primary importance because of its consideration of the entire performance, they emphasize this factor. They also devote a large part of their work to dynamic system performance characteristics in explaining how to determine operational ranges when using UHF communications systems.

To make the book as practical as possible, Messrs. Reed and Russell systematize communications devices, include information needed by the system elements designer, show how the best performance can be obtained by a closer approach to ideal installation practices, and take the maintenance problem into consideration.

Not only does the volume close the spatial circuit (the third dimension) for the first time, but it presents such modern highlights as the working methods for calculating radiation coverage patterns for antennas in the proximity of a spherical earth, gives necessary meteorological theory, covers complex antennas as well as simple dipoles, and goes into the possibilities of the sector antenna.

Both authors are with the U. S. Naval Air Test Center, Dr. Reed as a consultant, and Mr. Russell as chief engineer of the electronics test division. Dr. Reed is also professor of electrical engineering at the University of Maryland.

Engineered for better circuit protection to save you money

New SOAPSTONE OCT-O-DUCT

In the Far West this NEW SOAPSTONE conduit called OCT-O-DUCT is being used more and more in underground circuit construction. Its electrical and chemical characteristics are unequalled for this job.

OCT-O-DUCT is low-priced, cheap and easy to install, lasts forever. OCT-O-DUCT has smoothest bore of any conduit and is easiest on cables.

SOAPSTONE is your best assurance of Permanent Circuit Protection.

A range of sizes from 2" to 5", including bends, fittings and adapters, in stock at Oakland and Los Angeles, California.

Send for descriptive literature

SOAPSTONE DUCT COMPANY

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PERMANENT CIRCUIT PROTECTION

Since much of their experience has been with aircraft, they have drawn on this background for illustrative purposes but they point out the applications to ships, automobiles, trains, missiles, and related fields. W. M. Browne and J. W. Plummer, also with NATC, assisted in the preparation of the book.

This book may be purchased from TELEPHONY.

V V

R. L. Helmreich Appointed Long Lines' Operations Director

Ralph L. Helmreich, operating vice president of the Mountain States Telephone & Telegraph Co., was recently appointed director of operations of the Long Lines Department of the American Telephone & Telegraph Co. In his new capacity Mr. Helmreich will replace A. F. Jacobson, who is to become assistant vice president of AT&T. Both appointments became effective Nov. 1.

Mr. Helmreich will also become a member of the Long Lines board, according to an announcement released by Long Lines.

Mr. Helmreich has been operating vice president of the Mountain States company since July, 1952 and prior to that, had been the company's personnel vice president for about 16 months.

He began his Bell System career with the Southwestern Bell Telephone Co. in 1928. He was also with AT&T before joining Mountain States in 1950.

The Long Lines Department builds, operates and maintains the network of trunk circuits and other facilities in the United States which provide nationwide and worldwide telephone communication. Long Lines also provides extensive networks which speed radio and television programs from city to city and over which telephotographs are transmitted.

V V

Bell Official Named to CD Post

It was recently reported that Carl O. Lindeman, vice president and general manager of Northwestern Bell Telephone Co., has been named chief of the Minnesota Civil Defense communications division by Gov. C. Elmer Anderson.

V V

"A wise and frugal government, which shall restrain men from injuring one another, which shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned—this is the sum of good government." — THOMAS JEFFERSON.

Three Reasons Why Koppers Poles are Dependable

Dependable Company

Koppers Poles are made by an organization that has been a leader in the wood-preserving industry for more than half a century.

Dependable Quality

Koppers Poles are long-lasting. In the first place, they are always pressure-creosoted in strict adherence to specifications. Second, there is constant laboratory control over plant production, from a Technical Department that is foremost in the industry.

Dependable Service

Highly trained and experienced personnel in many strategically-located treating plants offer you prompt, reliable service.

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You can count on *Koppers*—the best-known name in pressure-treated wood.

KOPPERS COMPANY, INC.
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KOPPERS PRESSURE-CREOSOTED WOOD

Attending the ceremonies to dedicate the Theodore Gary Roadside Park in Missouri were MISS E. A. TERPENING (left), assistant secretary of Theodore Gary & Co., and members of the Gary family pictured at the right of Miss Terpening, from left to right: MRS. THEODORE GARY; W. H. LOOMIS III (grandson); MRS. W. H. LOOMIS JR. (daughter); THEODORE S. GARY (grandson); MRS. JOHN B. TAYLOR (sister); HOWARD G. SHARP (nephew), and MRS. LAURA KRUEGER (sister).

Dedicate Roadside Park in Memory of Theodore Gary

The Theodore Gary Roadside Park on U. S. Route 36 near Macon, Mo., was dedicated recently in memory of the late Theodore Gary, long-time prominent Independent telephone pioneer, and chairman of the first Missouri Highway Commission, appointed under the Centennial Road Law at the beginning of the building of a highway system in that state.

The roadside park project was sponsored by the Macon Rotary Club in cooperation with the Missouri Highway Commission. Macon was the home of Mr. Gary.

In addition to numerous state officials, members of Mr. Gary's family and a number of officials of the Gary group of telephone companies attended the dedication ceremonies.

B. H. Piepmeier of Black River Falls, Wis., vice president and general manager of the Community Telephone Co. of Wisconsin, who served as chief engineer of the Missouri Highway Commission when Mr. Gary was chairman, spoke at the ceremonies.

Members of the Gary family who were introduced as honored guests were: Mrs. Theodore Gary, of Macon; Mrs. Wesley Loomis, of Kansas City, Mo., Mr. Gary's daughter; his sisters, Mrs. Laura G. Krueger and Mrs. John D. Taylor, of Macon; his grandsons, Theodore S. Gary, of Chicago, and Wesley Loomis Jr., of Kansas City; and a nephew, Howard Sharp, of Chicago.

Pictured beside the marker in the Theodore Gary Roadside Park are B. H. PIEPMEIER (left) of Black River Falls, Wis., vice president of the Community Telephone Co. of Wisconsin and chief engineer of the first Missouri Highway Commission of which Mr. Gary was chairman, and REX M. WHITTON, present chief engineer of the highway commission. The plaque on the marker reads: "In memory of Theodore Gary who gratuitously devoted much time and thought to the building of highways for the state of Missouri. Erected by his son, Hunter Gary."

V V

Long Lines Plans TV Channels On Pittsburgh-St. Louis Route

Plans for additional TV channels along the Pittsburgh-St. Louis microwave route were made known by the Long Lines Department of the American Telephone & Telegraph Co. on Oct. 12, in a report of its application filed with the Federal Communications Commission.

The Pittsburgh-St. Louis system already has three eastbound channels for TV service between Dayton and Columbus and two westbound channels between Dayton and Indianapolis. These channels, together with the ones proposed, would establish a minimum of two video channels in each direction along the entire route. These would ultimately become part of a round-robin network serving TV stations from New York to Chicago and back to New York via St. Louis and Washington. This arrangement, Long Lines said, would greatly increase the flexibility of routing network programs.

To make the new channels available, Long Lines plans to install microwave transmitters at existing stations along the route. These would provide two eastbound channels between St. Louis and Dayton and two between Columbus and Pittsburgh; two westbound channels between Pittsburgh and Dayton and two between Indianapolis and St. Louis; and one westbound channel between Dayton and Indianapolis.

V V

"The best and most important part of every man's education is that which he gives himself."—GIBBON

CLOSE RANGE

"Only when problems are truly national should the federal government intervene. When power is close to the individual citizen he is better able to control its use. He can see its results, he knows personally the men who administer it, he understands its cost."—RICHARD M. NIXON, *Vice President of the United States.*

Want Both PEAK PERFORMANCE and LOWEST COST for your RURAL LINES?

String the NEW Copperweld O-Eighty-Thirty TELEPHONE LINE WIRE

. . . and get ALL these important advantages

A new Copperweld* development, the O-Eighty-Thirty (diameter .080"—30% conductivity) now makes it possible to have the advantages of Copperweld on your short subscriber loops and secondary toll lines at lowest cost.

The high tensile strength of O-Eighty-Thirty permits safe, economical long-span construction formerly obtainable only with larger, heavier wires. Its light weight means easier, faster handling plus economies in construction and shipping costs. In addition, Copperweld has excellent transmission qualities at voice frequencies and is the only high-strength conductor that can be effectively converted to carrier circuits when expanded facilities are required.

Plan now to build your new rural lines with Copperweld O-Eighty-Thirty Telephone Line Wire. You'll soon discover this new, high-strength, non-rusting rural conductor is unequaled in economy.

Write us today for prices, sag data and staking tables—there's no obligation.

*Trade Mark

- Low Material Cost
- Low Construction Cost
- Minimum Maintenance
- Good Conductance
- Permanent Strength
- Long, Rust-Resisting Life
- Safe Long Spans
- Savings on Poles and Hardware
- Light Weight
- Easy to Handle

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LOOK AT THE LONG SPANS YOU GET With O-Eighty-Thirty

LIGHT LOADING	150 to 550 ft.
MEDIUM LOADING	150 to 520 ft.
HEAVY LOADING	150 to 320 ft.

Many considerations enter into the selection of span length. O-Eighty-Thirty is versatile, readily adaptable to short, medium or long-span construction.

Copperweld TRADE MARK

Diameter .080" 30% Conductivity

LINE WIRE

The only conductor combining the strength of steel with the conductivity and permanence of copper!

SOLD BY LEADING DISTRIBUTORS

Long Lines Plans Fla. TV Link; Opens Ga.-Ky. Route

Plans for construction of a radio-relay system between Jacksonville and Orlando, Fla., were announced on Oct. 14 by the Long Lines Department of the American Telephone & Telegraph Co., reporting its application filed with the Federal Communications Commission.

The system would be the second link in a proposed route which would ultimately extend from Atlanta, Ga., to West Palm Beach, Fla.

Long Lines said the new microwave route would augment coaxial cable and open wire lines now providing communications in the Jacksonville-Orlando area. Since the broadband facilities on the existing routes between these two cities have reached their practical capacity, the new system is needed to meet the additional requirements.

Construction of the system would be a joint undertaking of the Southern Bell Telephone & Telegraph Co. and Long Lines, the announcement added.

A. F. Jacobson, Long Lines director of operations, said the company initially planned to provide four channels along the route; one channel in each direction would be used for conventional telephone and private line services and one in each direction for protection and maintenance.

The addition of these channels along the proposed route would release two channels on the Jacksonville-Orlando coaxial cable; released channels could then be used for television service, he said.

To carry the microwave signals along the 134-mile skyway Long Lines plans to construct five intermediate radio-relay stations. These stations would be equipped with tapered steel antenna-towers, ranging in height from 200 to 237 feet.

Long Lines also announced a new microwave route, extending from Louisville, Ky., to Atlanta, Ga., placed in service over the Oct. 16 week end. The 400-mile system runs through Nashville and branches to Chattanooga, Tenn.

The project was described as a joint undertaking by Southern Bell Telephone & Telegraph Co. and Long Lines.

Mr. Jacobson said the new system was needed to handle the increased telephone traffic in the area and to extend television network facilities into Tennessee. The ultimate capacity of the route would be well over 1,000 telephone circuits and several television channels.

Mr. Jacobson also said four channels, two in each direction, have been provided initially for telephone service.

"Later this year, a southbound television channel will be made available to carry network programs from Louisville to Nashville," he added.

To beam the microwave signals along the skyway, 12 intermediate radio-relay stations were constructed. The antennas which transmit the signals from station to station are mounted on steel towers ranging in height from 62 to 340 feet.

V V

J. J. Foley Named Commercial Manager of Ohio Company

John J. Foley, for 25 years commercial manager of The Michigan Bell Telephone Co.'s northern division, and

J. J. FOLEY

recently retired, became commercial manager of The Elyria (O.) Telephone Co. on Nov. 1.

Mr. Foley is a Bell System veteran of 45 years. He started his telephone career with The Bell Telephone Co. of Pennsylvania in 1908 and went to Michigan in 1916.

The Elyria Telephone Co. has under way a million-dollar expansion and improvement program which will be climaxed when a completely new dial system in a modern operating and office building is put into service in 1955.

Roy W. Ammel is president and general manager of the Elyria company.

V V

Tax Saving Possible With Government Out of Business

At least a billion dollars a year can be saved for taxpayers if the government stops competing with private enterprise, Richard L. Bowditch, presi-

PEATROPHONE

Answers Theatre Phones Automatically!

For the first time, theatre management can be certain that answers to calls for program information are delivered exactly in the form desired—giving a description of the program, a sales talk on the feature and the program schedule.

Peatrophone will answer every call, giving the 1000th caller the same courteous, enthusiastic answer as the first—since *one recording will cover an unlimited number of calls!*

Only Peatrophone can provide a *practical* automatic telephone-answering service for theatres, because (1) PEATROPHONE ALLOWS THE MANAGEMENT TO RECORD MESSAGES AT ANY TIME, RIGHT ON THE INSTRUMENT and (2) ONLY PEATROPHONE can operate on an announcement cycle only.

Write us today for descriptive literature on PEATROPHONE.

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dent of the Chamber of Commerce of the United States, predicted recently.

And this might be "just the beginning of possible savings," Mr. Bowditch declared in an address before the Propeller Club of the United States in Cleveland.

Mr. Bowditch made this prediction after pointing out that government competition with private industry will be among the many phases of government activity which will be studied by the new Commission on Organization of the Executive Branch. The group is also known as the new "Hoover Commission."

"Isn't it about time we got the government out of business—before it strangles our free economy?" Mr. Bowditch asked.

"I'm going to predict that if we get the government out of competition with private enterprise, a billion dollars annually might be just the beginning of possible savings."

He said the sale of the Federal Barge Lines after 29 years of government ownership was a long stride toward getting the federal government out of the commercial transport business.

Mr. Bowditch said the transportation industry also has a large stake in the work to be done by another group, the Commission on Intergovernmental Relations, which will study the whole broad field of federal-state relations.

"No one can even guess how much money we might save by redefining the responsibilities of federal, state and local government," he said, "but the economies would be tremendous."

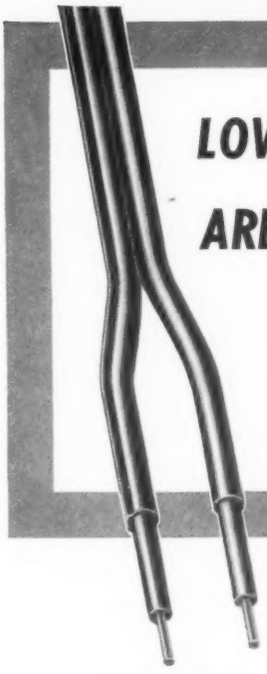
He said that "most people are prone to take our merchant fleet for granted —until full-scale war cracks around our heads."

The result, he said, is that our present merchant fleet is "near the halfway period of its normal economic life." While about 35 per cent of foreign merchant ships have been built since World War II, he said, only 8 per cent of our merchant fleet has been constructed since 1945.

"The future building program does not look bright," said Mr. Bowditch. "Currently, there is no visible definite program for replacement of the existing fleet nor for its normal expansion and modernization."

Mr. Bowditch said that in 1939, American ships carried less than 22 per cent of our foreign trade, but this figure had risen to better than 65 per cent by 1946. Last year, he added, it had dropped to a little more than 37 per cent. He said the U. S. Chamber agrees with the shipping industry that a fair figure would be 50 per cent.

No. 1 in a series of test results on LOWELL TELEPHONE WIRES: Resistance to Compression



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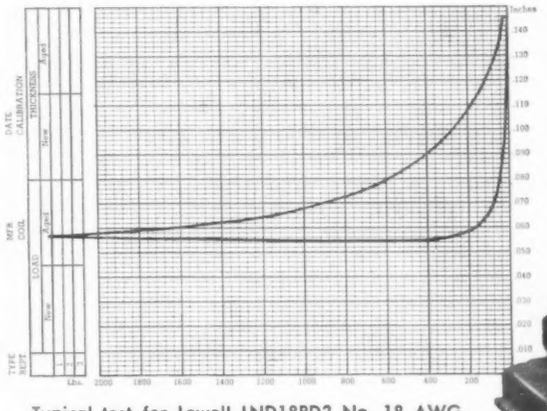
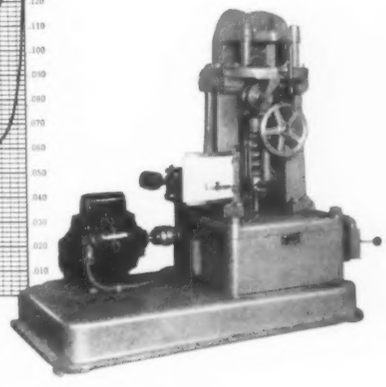
In determining the ability of a drop wire to stand up in service, resistance to compression is a major factor. All Lowell parallel neoprene jacketed drop wire is tested in our laboratory to withstand pressure of 2000 lbs. or more before the insulation jackets are crushed. To insure this high resistance to compression, all conductors are brass flashed and special insulating and jacketing compounds are used. Since resistance to compression determines the quality of the adhesion these tests prove that Lowell Drop Wire will stand the crushing action of the P Clamp without cracking of the insulation or jacket, thus insuring dependability and long life in service.



Typical test for Lowell LND18PD2 No. 18 AWG Dumbell design parallel wire, illustrated showing minimum resistance to compression of 2000 lbs.



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Foreign News

(From TELEPHONY's correspondent in Mexico, D. Grahame.)

Answering complaints for improvement and expansion of service, Telefonos de Mexico, S.A., Mexico's major Independent telephone company, recently stated that an investment of at least 600 million pesos ($69,300,000) would be required for such a program in the city's Federal District alone.

The company states it has no such funds available. Its gross profits last year amounted to 116 million pesos ($13,150,000) but taxes, wages and other costs cut its 1952 dividend to 10 per cent net.

The Ministry of Communications and Public Works has announced that its service inspectors have checked the operation of 15,000 telephones in Mexico City. This action probably results from the country's active newspaper campaign for better telephone service.

Meanwhile, Telefonos is installing a Roter 72-A for 18,000 lines at Monterrey, the industrial center on the eastern Texas border which is the capital of Nuevo Leon State. The company is investing 50 million pesos ($5,780,000) in service improvements at Monterrey, and a cut-over to dial is scheduled for this fall.

Telefonos has petitioned a 25 per cent rate increase in Monterrey to cover the cost of its modernization program there, but the city's Chamber of Commerce protested the raise to the Ministry of Communications and Public Works. The chamber considers the raise excessive and holds that any increase should not be made effective until after the improved service begins.

Mexico's President Adolfo Ruiz Cortines is considering a 400-million-peso ($46,510,00) financing plan to enable Telefonos to render better service. It is reported the plan would rely on Mexican funds exclusively without calling on foreign aid.

The Ministry has also started coordination of telephone service and the linking of private and public lines through Mexico. It has made a contract with the Cia. Nacional Telefonica, S.A., for joint use by it and government services, of lines between Monterrey on the eastern Texas border, and Piedras Negras, across the border from Eagle Pass, Tex. Its stated purpose is the achievement of "a greater physical capacity in the transmission and reception of messages."

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Hubbard Company Announces Personnel Changes

Clifford H. Keen has been made divisional sales manager, eastern division, electrical materials department, with headquarters in Pittsburgh, Hubbard & Co. recently announced. Mr. Keen has been with the Hubbard company since 1923 and has successively served as an assistant in the advertising department, a salesman in New England, New York City district sales manager, and divisional sales manager of the New York area.

William W. Ege Jr. succeeds John Flippen as sales engineer in the Kentucky-Tennessee territory. Mr. Ege has been with the company since the war, in which he served as technician's mate in the Navy. He received his degree at Carnegie Tech. He has been covering eastern Pennsylvania, central and southern New Jersey, Maryland, and northern Virginia.

John P. Flippen has been transferred from the Kentucky-Tennessee territory to the local Pittsburgh territory as sales engineer. Mr. Flippen served in the Naval Air Corps, graduated from Lehigh University, and has been with Hubbard & Co. for two years.

Maynard P. West Jr., who has been with Hubbard since his graduation, selling in Virginia and the Carolinas, and in the production department, as sales engineer in the Pittsburgh territory, now goes in the same capacity to metropolitan New York. Mr. West was an electrician's mate in the Navy during the war and later finished his course at Virginia Polytech.

V V

Great Lakes Radio-Telephone System Praised

The communications system provided Great Lake shippers by The Lorain Radio Corp., Lorain, O., was described as the world's greatest marine telephone system by Donald C. Potts, president of the Pittsburgh Steamship Division of the United States Steel Corp., in an address at the recent annual meeting of the Propeller Club in Cleveland.

Mr. Potts stated that "Lake shippers have always been leaders in the matter of safety. The Great Lakes are served by the world's greatest marine telephone system, and all bulk carriers have radio-telephones by which they communicate with each other and with shore stations. All have radio direction finders, and the modern fleets not only have gyro-compasses, but radar."

A prominent Ohio Independent telephone executive, H. E. Hageman, president of the Lorain Telephone Co., is president of the Lorain County Radio

Corp. He is a pioneer in developing communications for Great Lakes shippers.

Mr. Hageman reports that the large commercial ships on the Great Lakes are now using 16 communication channels to handle their communication needs. Eight of the channels use AM equipment and eight use VHF equipment. Eight of the channels are for intership and safety communication and eight will be used for ship-to-shore calls. Practically all channels are loaded to capacity, he said.

V V

E. C. Roworth, S-C Corporate Secretary, Retires

Edwin C. Roworth, corporate secretary of Stromberg-Carlson Co., Rochester, N. Y., retired on Oct. 1 after more than 48 years continuous service. Employed in many different capacities

E. C. ROWORTH

with the 60-year-old communications company, Mr. Roworth became vice president in charge of finance in 1940, and corporate secretary in 1946.

The Sept. 29 fall meeting of the Stromberg-Carlson Quarter Century Club, was largely devoted to honoring Mr. Roworth. He was one of the founders of the club in 1947, served a term as chairman, and helped guide its activities throughout its existence.

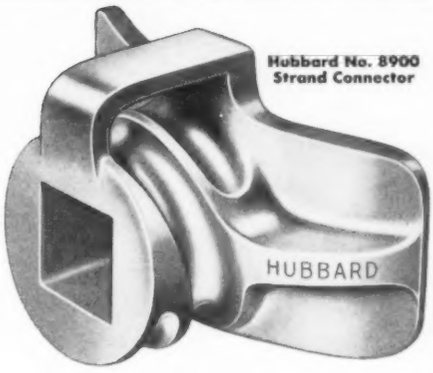
Toastmaster of the affair was C. O. Dasson, sales engineer of the company's telephone division and present chairman of the quarter century club.

The group was addressed by Gordon G. Hoit, vice president of the company, and George E. Eyer, industrial relations manager. Mr. Roworth received a gift from the club, and a life membership in the Telephone Pioneers of America.

Mr. Roworth also was guest of honor at an informal party held on Sept. 24

HUBBARD STRAND CONNECTOR

The Hubbard No. 8900 Strand Connector was developed to provide a means for connecting the ends of telephone cable messengers at the pole, and is universally used by the largest telephone companies. It is used especially in connection with the installation of cable rings. It eliminates connecting messengers in the middle of the span and provides an efficient and safer means of support. Cable spinning equipment will not pass over the mid-span connections, therefore the No. 8900 is essential for all cable spinning installations.



Hubbard No. 8900 Strand Connector

Hot Galvanized

Phantom view showing how Messengers are installed on the Hubbard No. 8900 Strand Connector

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OVERHEAD

Cable Suspension Material—Wireholders Pole Seats and Balconies—Clevises Braces—Drive Hooks—Messenger Dead Ends—Extension Arms—Long Span Material—Pins—Clamps—Guards—Stubbing Bands—Guy Protectors—Guy Clamps Pole Struts—Clips—Straps—Hangers Carriage Bolts—Rings—Transposition Brackets—Eye Bolts—Pole, Corner and House Brackets—Guy Hooks—Strain Plates—Storm Guy Straps—Lags—Machine and Hubeye Bolts—Sidewalk Guys REA Telephone Hardware

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at which Stromberg-Carlson President R. C. Tait presented him with a watch, and friends made up a purse of money. At that time Mr. Roworth told his retirement plans for travel in the South and West, and pursuit of his hobbies of conchology, color photography, and mineralogy.

V V

Lenkurt Electric Names K. R. Rickey Controller

A former Chicago business executive, Kenneth R. Rickey, has been named controller of the Lenkurt Electric Co., Inc., San Carlos, Cal.

Lenkurt manufactures telephone and telegraph carrier equipment, microwave radio systems and electronic components.

Prior to joining the California company last June, Mr. Rickey had been secretary-treasurer of Curtis Lighting,

K. R. RICKEY

Inc., Chicago, since 1946. He formerly was associated with the Zenith Radio Corp. and the Stewart Warner Corp. in Chicago.

Mr. Rickey is a member of the National Association of Cost Accountants and last year served as president of the association's Chicago chapter. He also is a member of the American Institute of Accountants.

He is a native of Iowa and a graduate of the State University of Iowa.

V V

P. C. Sandretto Heads IT&T Labs.

It was announced on Oct. 10 that Brigadier General Peter C. Sandretto, U. S. Air Force Reserve, author of many articles on aerial navigation systems and of the book "Principles of Aeronautical Radio Engineering," has been appointed technical director of the Federal Telecommunication Laboratories, Nutley, N. J., a division of International Telephone & Telegraph Corp. He formerly was assistant technical director.

V V

Roloson Named Sales Manager For Luther Corporation

The appointment of Gray Roloson as sales manager for the Luther Corp. of Williams Bay, Wis., has been announced by Robert F. Meyer, president.

Mr. Roloson formerly was district applications engineer for Scintilla Mag-

GRAY ROLOSON

neto, a division of the Bendix Aviation Corp. of Sidney, N. Y. He was with the company for 15 years.

In his new position, Mr. Roloson will direct the sales activities for the Luther chain saw, the first of many products being introduced by the company.

He will also be responsible for organizing the nationwide sales distribution program to handle this product and other lines of Luther-manufactured equipment.

V V

Joslyn Mfg. Company Elects Six New Vice Presidents

P. W. Lotz, president of Joslyn Mfg. & Supply Co., Chicago, Ill., has announced that four managers of the company's principal subsidiaries and two members of the Chicago executive staff were elected vice presidents of the parent company.

The appointments were made at a recent meeting of the board of directors, and the newly elected officers are: R. H. Gasch, vice president and manager, The Joslyn Co., New York, N. Y.; R. B. MacDonald, vice president and manager, Joslyn Pacific Co., Los Angeles, Cal.; E. R. McCoy, sales manager, Joslyn Mfg. & Supply Co., Chicago, Ill.; C. C. McKirahan, vice president and manager, Southern Jos-

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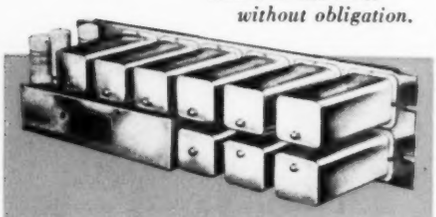

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V V

Copperweld Steel Company Makes New Appointments

Announcement has been made by the Copperweld Steel Co. of the promotion of F. E. Leib to manager of sales of

F. E. LEIB

the wire and cable division, Glassport, Pa. He was chief electrical engineer during the last 3½ years. Prior to that, Mr. Leib was assistant manager of sales. He starts in his new position with a background of over 25 years experience in the electrical industry.

Other promotions announced at the same time involve R. C. Ridley, who was appointed assistant manager of

R. C. RIDLEY

sales; C. C. Sowards who was elevated to eastern sales manager, with headquarters in New York City, and E. G. Elg, who was made western sales manager, with offices in Chicago.

H. J. Billica at San Francisco and L. McGuire at Seattle, continue to function as Pacific district manager and Pacific Northwest district manager respectively.

Templeton, Kenly Company Moves Into New Plant

Templeton, Kenly & Co., manufacturer of Simplex jacks, has moved into its new plant in Broadview, Ill., a suburb of Chicago.

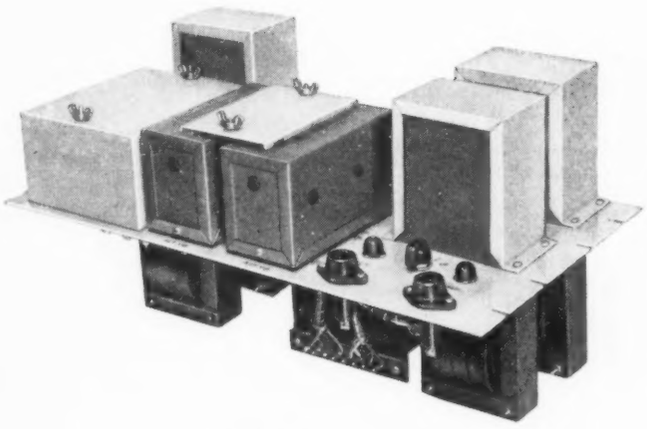
The move to larger, more efficient quarters was dictated by the development of new products, particularly hydraulic jacks and pullers, according to the company's president, J. B. Templeton.

The single-story plant contains 96,000 square feet of space. Manufacture of all types of Simplex lever, screw and hydraulic jacks will be possible in the new plant, it was reported. A noteworthy feature of the manufacturing section is a centrally located parts storage area which is easily accessible to both machining and assembly divisions. Shipping and receiving facilities include a four-truck dock and two-car rail siding. The plant has a steel roof, a wood block floor and fluorescent lighting throughout.

To harmonize with homes in the bordering Westchester residential area, the office section at the front of the plant is built of face brick and shot sawed limestone. Visitors are received in an oak-paneled lobby with quarry tile floor.

Artist's conception of new Templeton, Kenly & Co. plant in Broadview, Ill.

ANOTHER C-D "FIRST"



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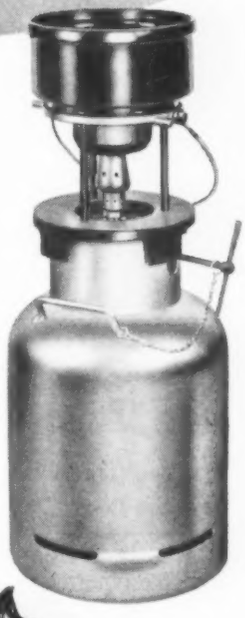

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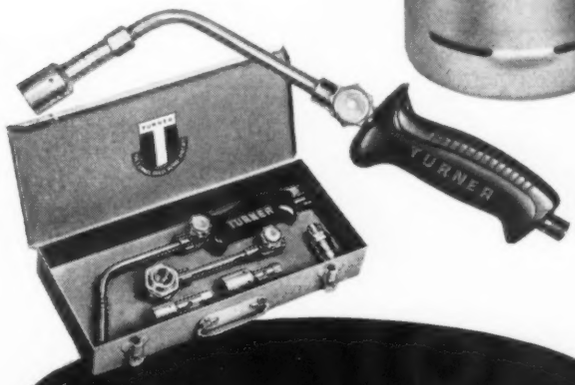

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Graybar Electric Opens Two New Branches

A new branch of the Graybar Electric Co. was opened at Springfield, Ill., on Oct. 1, according to C. S. Powell, Mississippi Valley district manager. Harry Bryson has been appointed manager of the new branch, and C. W. Kraich is operating manager.

Mr. Bryson joined Graybar as a salesman at Peoria in 1937. A native of Sherrard, Ill., he is a member of the Springfield Engineers Club. He attended Illinois Business College.

Mr. Kraich joined the company at St. Louis in 1945 and held stock maintenance and office salesman positions up to the time of his present appointment. He attended Washington University.

Another new branch of the Graybar company was opened at 1601 S. Treadaway, Abilene, Tex., on Oct. 1, Southwestern District Manager V. A. Elmblad has announced. E. L. Preston has been appointed manager and H. L. Coldwell operating manager.

Mr. Preston has been with the Graybar company for 28 years. He joined the operating department at Dallas and in 1927 moved to Beaumont, Tex., as operating manager. In 1941 he moved to Houston in the same capacity, becoming salesman at Ft. Worth in 1946. A native of McLean, Neb., he is a graduate of Nebraska State University.

Mr. Coldwell joined the company in the operating department at Dallas in 1950. His experience includes work in stock maintenance and as office salesman at Dallas and San Antonio. He is a native of Garland, Tex., and received a B.B.A. degree from Southern Methodist.

V V

Electric Storage Battery Co. Names New Division Head

Supplementing his duties as vice president and director of The Electric Storage Battery Co. of Philadelphia, Pa., Roland Whitehurst has been appointed general manager of the company's industrial products division. According to S. Wyman Rolph, president, Mr. Whitehurst's appointment was a final step in complete separation of company operations into two divisions —industrial, and automotive products.

Mr. Whitehurst was born in 1893 in Manchester, England, where he attended elementary school. He came to the United States with his family as a boy, and completed his higher education in night and extension courses here.

In 1908 he was employed by The Electric Storage Battery Co. as an office boy in the New York branch. After serving as sales representative there he was appointed manager of the company's Washington branch in 1920. In 1940, he was transferred to the company's general offices as assistant general sales manager, and in 1942 was made sales manager. Since 1948 he has been Exide's vice president in charge of sales. In 1951 he was elected to the board of directors.

Mr. Whitehurst is past chairman of the Industrial Truck Association's battery section, and has also served on the executive committee. He is a fellow of the American Institute of Electrical Engineers and a member of that society's board of examiners.

He is author of "Lead-Acid Batteries in the Transportation Field."

V V

Townley, Hahn New Managers For Highway Trailer

The appointments of E. L. Townley as western regional manager and Raymond O. Hahn as manager of the Cincinnati branch were announced recently by F. C. Gokey, executive vice president of the Highway Trailer Co., Edgerton, Wis.

E. L. TOWNLEY

Mr. Townley joins the Highway Trailer Co. after 16 years in the automotive field and trucking industry, having been associated with the Ford Motor Co. and for the past three years with the General Truck & Equipment Co., St. Paul, in the capacity of sales manager for Highway Trailer sales and associated equipment.

Mr. Gokey stated that Mr. Townley's headquarters office will be at 1610 Fremont, St. Paul, Minn.

Mr. Hahn has been employed as a salesman at the Cincinnati branch for the past three years. Prior to that time he had been associated with the Wright Aeronautical Corp., Industrial Enter-

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Holtzer-Cabot Adds Achenbach To Engineering Staff

Holtzer-Cabot telephone equipment division of National Pneumatic Co., Inc., and Holtzer-Cabot Divisions, Boston, Mass., have announced the appointment of C. H. Achenbach as consulting engineer in the development of telephone power equipment.

Mr. Achenbach had been for 38 years with the Bell System, 22 years of which were spent in laboratory development of power supplies for Bell's transmission and central office equipment. For the last 10 years he has had charge of power engineering and development work for the Bell organization.

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